ISO/IEC17025 Accredited Lab.

FCC ID
TEST REPORT

for

OTT

MODEL: FREEOTT

Trade Mark: N/A

FCC ID: 2AACAFREEOTT

Test Report Number: 1304001374

Issued Date: May 16, 2013

Issued for

Syabas Technology Hong Kong, Limited

FLAT/RM 316A 3/F , ENTERPRISE PLACE PHASE ONE HONG KONG SCIENCE PARK PAK SHEK KOK TAI PO NT

Issued By:

SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO., LTD.

5/F,Block 4, Anhua Industrial Zone., No.8 Tairan Rd. Chegongmiao, Futian District Shenzhen, China

TEL: +86-755-83448688

FAX: +86-755-83442996

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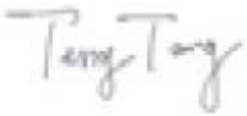
1 TEST CERTIFICATION

Product:	OTT
Model:	FREEOTT
Trade Mark	N/A
Applicant:	**Syabas Technology Hong Kong, Limited** FLAT/RM 316A 3/F , ENTERPRISE PLACE PHASE ONE HONG KONG SCIENCE PARK PAK SHEK KOK TAI PO NT
Manufacturer:	**Syabas Technology Hong Kong, Limited** FLAT/RM 316A 3/F , ENTERPRISE PLACE PHASE ONE HONG KONG SCIENCE PARK PAK SHEK KOK TAI PO NT
Tested:	April 14, 2013 ~ April 26, 2013
Test Voltage:	DC 5V (Adapter Input AC 120V/60Hz)
Applicable Standards:	FCC Part 15 rules: 2012 ANSI C63.4:2003

The above equipment has been tested by SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO., LTD. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By: ***Date:*** ***2013-05-16***

(Brown Lu)



Check By: ***Date:*** ***2013-05-16***

(Terry Tang)

Approved By: ***Date:*** ***2013-05-16***

(Jack Chung)

2 TEST RESULT SUMMARY

FCC Part 15 Subpart C, Paragraph 15.247

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Pass
§15.207 (a)	Conducted Emissions	Pass
§15.247(d)	Spurious Emissions at Antenna Port	Pass
§15.205	Restricted Bands	Pass
§15.209, §15.205, 1§15.247(d)	Spurious Emissions	Pass
§15.247 (a)(2)	6 dB Bandwidth	Pass
§15.247(b)(3)	Maximum Peak Output Power	Pass
§15.247(d)	100kHz Bandwidth of Frequency Band Edge	Pass
§15.247(e)	Power Spectral Density	Pass

NOTE:

” N/A” denotes test is not applicable in this Test Report

The test result judgment is decided by the limit of test standard

3 EUT DESCRIPTION

Product	OTT
Trade Mark	N/A
Model	FREEOTT
Applicant	Syabas Technology Hong Kong, Limited
EUT Type	☒ Engineering Sample. ☐ Product Sample, ☐ Mass Product Sample.
Serial Number	N/A
Antenna Type	PCB Antenna
Antenna Gain	0dbi
EUT Power Rating	DC 5V Adapter: RG05U-CE Input: AC 100-240V 50/60Hz 0.2A Output: DC 5.0V 1A
Temperature Range(Operating)	-10~50℃
Operating Frequency (WIFI)	802.11b/g/n-HT20: 2412MHz - 2462MHz
Type of Modulation	CCK, DQPSK, DBPSK for DSSS BPSK, QPSK, 16QAM and 64QAM for OFDM
Number of Channels	802.11b/g/n-HT20: 11 channels
Data rate	802.11b: 1-11Mbps 802.11g: 6-54Mbps 802.11n-20M: 6.5-72.2Mbps

Note: N/A stand for no applicable.

4 SETUP OF EQUIPMENT UNDER TEST AND TEST EQUIPMENTS USED

EQUIPMENT/FACILITIES	MANUFACTURER	MODEL #	SERIAL NO.	CAL. DUE DATE	CAL. INTERVAL
EMI Test Receiver	R&S	ESCI	100005	12/16/2013	1 Year
LISN	LS	LS16	16010222119	12/16/2013	1 Year
LISN(EUT)	Mestec	AN3016	04/10040	12/22/2013	1 Year
EMI Test Receiver	R&S	ESCI	100005	12/16/2013	1 Year
Spectrum Analyzer	R&S	FSU	100114	12/14/2013	1 Year
Pre Amplifier	H.P.	HP8447E	2945A02715	12/16/2013	1 Year
Pre-Amplifier	Compliance	PAM0118	1360976	12/16/2013	1 Year
Bilog Antenna	SUNOL Sciences	JB3	A021907	12/10/2013	1 Year
Horn Antenna	Schwarzbeck	BBHA 9170	RS2036	12/10/2013	1 Year
Horn Antenna	Schwarzbeck	BBHA 9120	RS4051	12/10/2013	1 Year
Loop Antenna	Schwarzbeck	FESP5132	RS101	12/23/2013	1 Year
Cable	TIME MICROWAVE	LMR-400	N-TYPE04	12/09/2013	1 Year
Cable	TIME MICROWAVE	--	--	12/09/2013	1 Year
System-Controller	CCS	N/A	N/A	N.C.R	1 Year
Turn Table	CCS	N/A	N/A	N.C.R	1 Year
Antenna Tower	CCS	N/A	N/A	N.C.R	1 Year
Spectrum analyzer	Agilent	E4407B	88156318	12/09/2013	1 Year

4.1. DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1	TV	P2450H	LS24LRZKU/XF	N/A	Samsung	N/A	N/A

Note:

1) All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

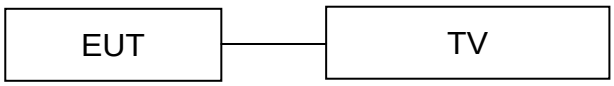
4.2. Description of Test Configuration

For 802.11b and 802.11g mode and 802.11n(20), 11 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437	/	/

EUT was tested with Channel 1, 6 and 11 in 802.11b/g/n-HT20

4.3. CONFIGURATION OF SYSTEM UNDER TEST



(EUT: OTT)

4.4. Justification

1. Set up EUT with the relative support equipments.

2. Make sure the test software control the EUT woking state.

(according to the standard measurement).

5 FACILITIES AND ACCREDITATIONS

5.1. FACILITIES

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.
The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAL. This approval result is accepted by MRA of APLAC.
Our test facility is recognized, certified, or accredited by the following organizations:

CNAL-LAB Code: L2292
The EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 899988
The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 899988.

IC- Registration No.: IC5205A-01
The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration IC No.: 5205A-01

5.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

No.	Item	Uncertainty
1	Conducted Emission Test	±3.6dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.7dB
5	All emissions,radiated(>1G)	±4.7dB
6	Temperature	±0.5°C
7	Humidity	±2%

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT uses a inside jointing PCB Antenna, The Antenna is unique coupling antenna. The Antenna gain is 0dBi.please refer to the EUT internal photos.

§15.207 - CONDUCTED EMISSIONS

Applicable Standard

The specification used was with the FCC Part 15.207 limits.

Test Procedure

During the conducted emission test, the EUT was connected to the outlet of the LISN.
Maximizing procedure was performed on the six (6) highest emissions of the EUT.
All data was recorded in the Quasi-peak and average detection mode.

Test Result

PASS

Test Mode: Normal Operating

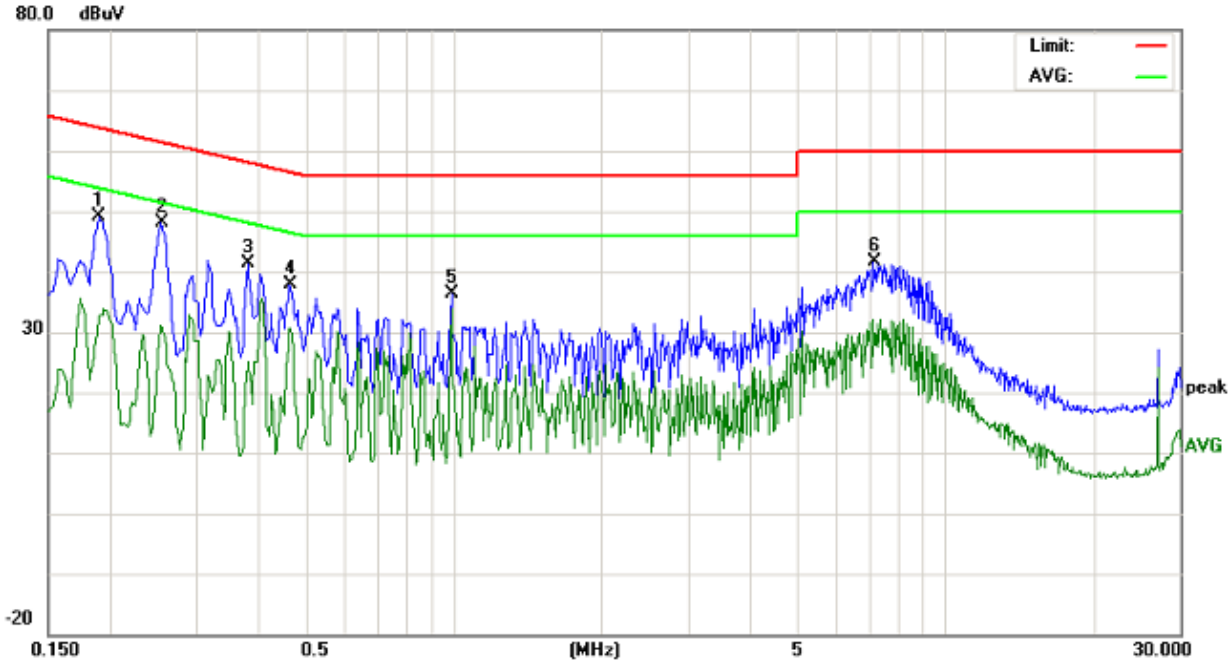
Environmental Conditions

Temperature:	26 °C
Relative Humidity:	60%
ATM Pressure:	100.0kPa

Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

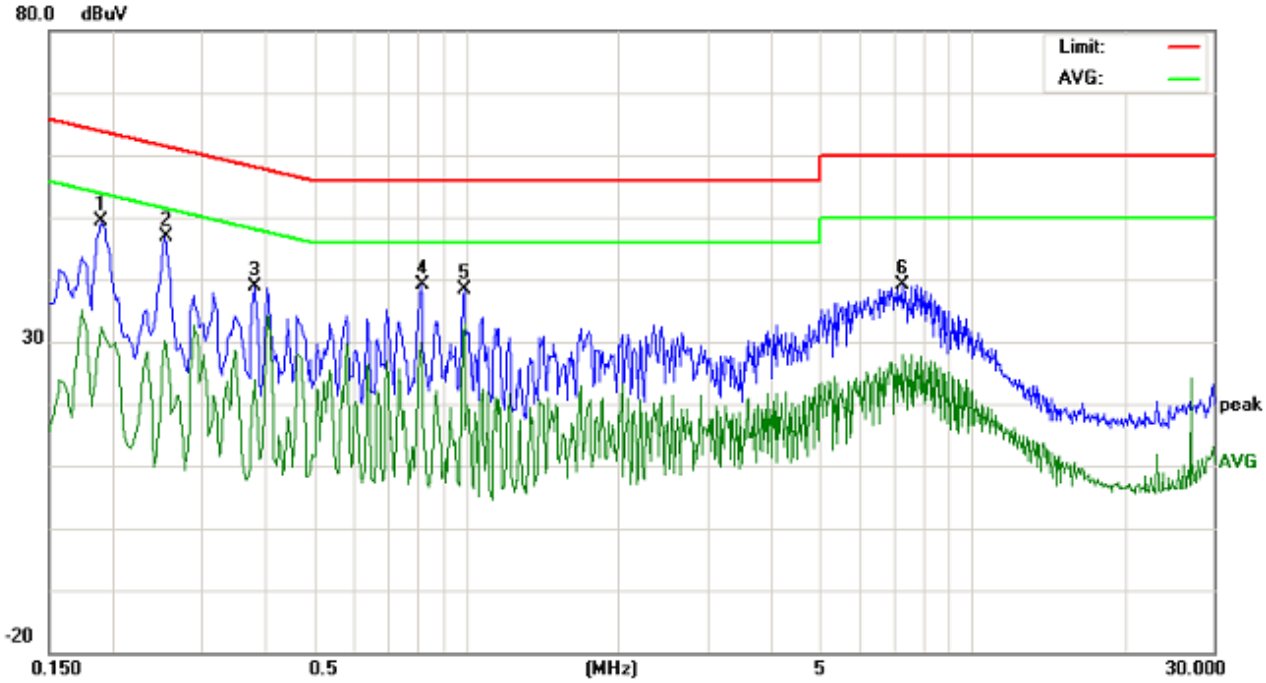
Phase: Live



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1900	38.78	10.33	49.11	64.03	-14.92	peak	
2	*	0.2540	37.73	10.49	48.22	61.62	-13.40	peak	
3		0.3820	30.94	10.53	41.47	58.23	-16.76	peak	
4		0.4660	27.42	10.43	37.85	56.58	-18.73	peak	
5		0.9900	25.63	10.77	36.40	56.00	-19.60	peak	
6		7.1619	31.03	10.51	41.54	60.00	-18.46	peak	

Remark: All of the Tx modes have been investigated, and only worst mode is presented in this report.

Phase:Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1900	39.07	10.33	49.40	64.03	-14.63	peak	
2		0.2540	36.46	10.49	46.95	61.62	-14.67	peak	
3		0.3820	28.34	10.53	38.87	58.23	-19.36	peak	
4		0.8139	28.58	10.56	39.14	56.00	-16.86	peak	
5		0.9900	27.66	10.77	38.43	56.00	-17.57	peak	
6		7.2659	28.62	10.51	39.13	60.00	-20.87	peak	

Remark:All of the Tx modes have been investigated, and only worst mode is presented in this report.

§15.209, §15.205, §15.247(d) - SPURIOUS EMISSIONS

Test Equipment

Please refer to section 4 this report.

Test Procedure

The out of band emission tests were performed in the 3-meter chamber test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC Part Subpart C limits.

Environmental Conditions

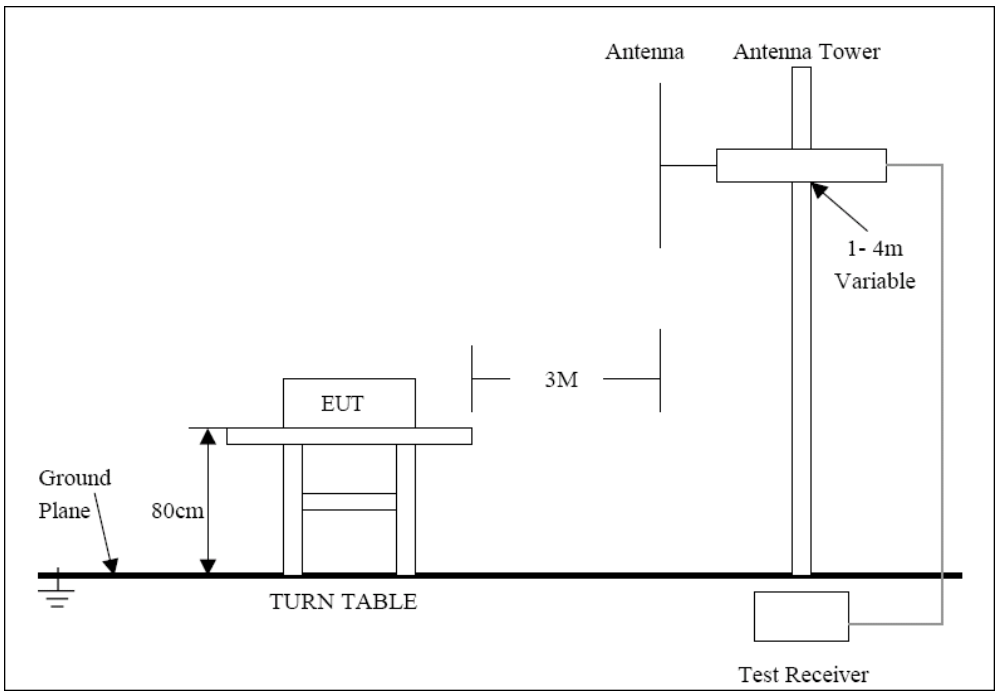
Temperature:	26 °C
Relative Humidity:	55%
ATM Pressure:	100.0kPa

Radiated Test Setup

The system was investigated from 9KHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	Detector
9KHz-30MHz	9kHz	30 kHz	QP
30 MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 25 GHz	1 MHz	3 MHz	PK
1000 MHz – 25 GHz	1 MHz	10 Hz	Ave



For the accrual test configuration, please refer to the related items-photos of Testing.

Radiated Emission Limit

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

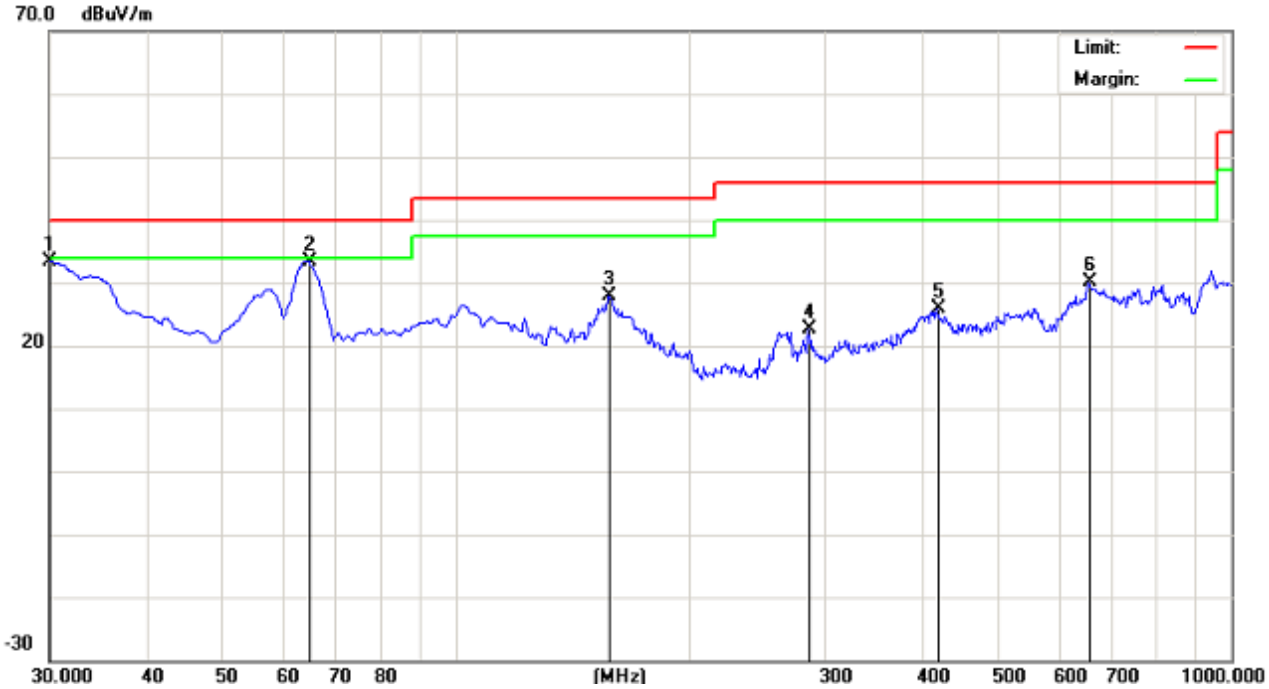
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30
30–88	100**	3
88–216	150**	3
216–960	200**	3
Above 960	500	3

Radiated Emission Test Result

Test Mode: Transmitting

NOTE: 9KHz-30MHz the measurements were greater than 20dB below the limit.

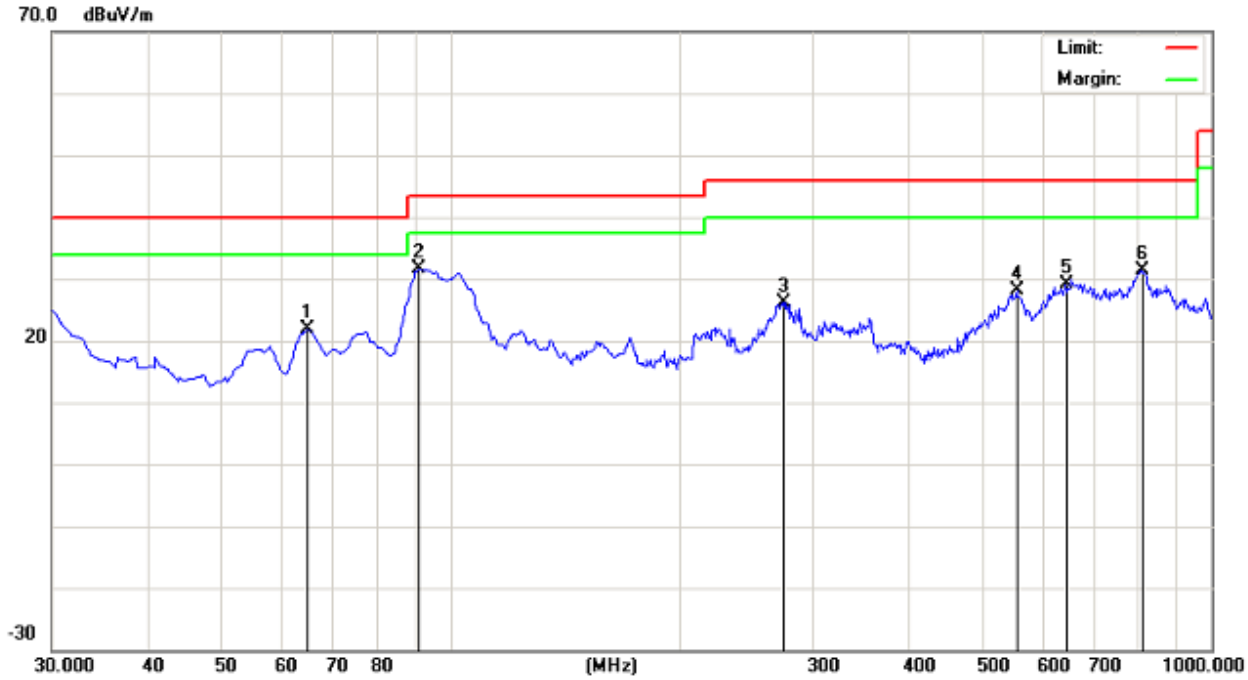
Horizontal:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
6		807.9400	24.64	6.78	31.42	46.00	-14.58	peak			
1		30.0000	36.38	-2.95	33.43	40.00	-6.57	peak			
2	*	64.9200	44.54	-11.09	33.45	40.00	-6.55	peak			
3		158.0399	31.58	-3.74	27.84	43.50	-15.66	peak			
4		285.1099	26.60	-3.87	22.73	46.00	-23.27	peak			
5		418.9700	25.52	0.24	25.76	46.00	-20.24	peak			
6		654.6799	24.85	5.30	30.15	46.00	-15.85	peak			

Remark:All of the Tx modes have been investigated, and only worst mode is presented in this report.

Vertical:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
2	*	64.9200	48.54	-11.09	37.45	40.00	-2.55	peak			
1		64.9200	32.83	-10.98	21.85	40.00	-18.15	peak			
2	*	91.1100	41.08	-9.50	31.58	43.50	-11.92	peak			
3		273.4700	30.39	-4.20	26.19	46.00	-19.81	peak			
4		556.7100	25.18	2.83	28.01	46.00	-17.99	peak			
5		644.0100	24.93	4.19	29.12	46.00	-16.88	peak			
6		807.9400	24.64	6.78	31.42	46.00	-14.58	peak			

Remark:All of the Tx modes have been investigated, and only worst mode is presented in this report.

Above 1GHz:

Operation Mode:	802.11b TX Channel 1	Test Date :	April 20, 2013
Frequency Range:	Above 1GHz	Temperature :	28℃
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	LHZ

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
5192.102	V	41.76	30.14	74	54	-24.24	-15.86
9514.284	V	42.86	29.43	74	54	-31.14	-24.57
9834.662	V	45.88	27.15	74	54	-20.12	-18.85
5213.527	H	58.44	48.60	74	54	-15.56	-5.40
9887.977	H	54.45	45.57	74	54	-19.55	-8.43

All emissions not reported were more than 20dB below the specified limit or in the noise floor.

Note: (1) All Readings are Peak Value and AV.

(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode:	802.11b TX (Channel 6)	Test Date :	April 20, 2013
Frequency Range:	Above 1GHz	Temperature :	28℃
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	LHZ

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
9863.402	V	56.45	45.17	74	54	-17.55	-8.83
10911.284	V	53.57	43.07	74	54	-20.43	-10.93
5189.132	H	57.19	48.64	74	54	-16.81	-5.36
5558.827	H	57.32	48.54	74	54	-16.68	-5.46
9657.717	H	53.22	45.71	74	54	-20.78	-8.29

All emissions not reported were more than 20dB below the specified limit or in the noise floor.

Note: (1) All Readings are Peak Value and AV.

(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode:	802.11b TX (Channel 11)	Test Date :	April 20, 2013
Frequency Range:	Above 1GHz	Temperature :	28℃
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	LHZ

Freq.	Ant.Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
5230.372	V	60.67	49.12	74	54	-13.33	-4.88
7269.514	V	57.59	47.28	74	54	-16.41	-6.72
8692.912	V	56.59	47.64	74	54	-17.41	-6.36
9942.727	V	54.01	44.76	74	54	-19.99	-9.24
7826.417	H	57.37	46.73	74	54	-16.63	-7.27
10019.255	H	57.07	44.97	74	54	-16.94	-9.04

No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.247.

Note: (1) All Readings are Peak Value and AV.

(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3) Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode:	802.11g TX Channel 1	Test Date :	April 20, 2013
Frequency Range:	Above 1GHz	Temperature :	28℃
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	LHZ

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV) PK	Emission Level(dBuV) AV	Limit 3m(dBuV/m) PK	Limit 3m(dBuV/m) AV	Over(dB) PK	Over(dB) AV
5225.142	V	58.29	48.35	74	54	-15.71	-5.65
9855.704	V	55.50	44.43	74	54	-18.50	-9.57
10794.692	V	55.95	43.24	74	54	-18.05	-10.76
5172.377	H	59.19	49.36	74	54	-14.81	-4.64
7167.487	H	54.21	47.60	74	54	-19.79	-6.40
9964.585	H	53.29	44.51	74	54	-20.72	-9.50

All emissions not reported were more than 20dB below the specified limit or in the noise floor.

Note: (1) All Readings are Peak Value and AV.

(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3) Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode:	802.11g TX (Channel 6)	Test Date :	April 20, 2013
Frequency Range:	Above 1GHz	Temperature :	28℃
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	LHZ

Freq.	Ant.Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
5230.052	V	56.22	48.28	74	54	-17.78	-5.72
9855.604	V	56.70	47.18	74	54	-17.30	-6.82
10797.822	V	52.67	44.25	74	54	-21.33	-9.75
5168.207	H	59.16	48.44	74	54	-14.84	-5.56
7168.387	H	57.29	47.41	74	54	-16.71	-6.59
9966.915	H	54.32	43.30	74	54	-19.69	-10.71

All emissions not reported were more than 20dB below the specified limit or in the noise floor.

Note: (1) All Readings are Peak Value and AV.

(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3) Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode:	802.11g TX (Channel 11)	Test Date :	April 20, 2013
Frequency Range:	Above 1GHz	Temperature :	28℃
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	LHZ

Freq.	Ant.Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
9801.432	V	52.13	41.25	74	54	-21.87	-12.75
10852.284	V	54.48	41.81	74	54	-19.52	-12.19
11702.242	V	56.47	42.69	74	54	-17.53	-11.31
7703.487	H	49.18	39.38	74	54	-24.82	-14.62
9781.697	H	52.40	41.42	74	54	-21.60	-12.58
11266.315	H	52.02	41.79	74	54	-21.99	-12.22

No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.247.

Note: (1) All Readings are Peak Value and AV.

(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode:	802.11n TX Channel 1	Test Date :	April 20, 2013
Frequency Range:	Above 1GHz	Temperature :	28℃
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	LHZ

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
5192.111	V	41.77	30.15	74	54	-24.23	-15.85
9514.255	V	42.84	29.41	74	54	-31.17	-24.60
9834.658	V	45.88	27.15	74	54	-20.12	-18.85
5213.511	H	58.42	48.58	74	54	-15.58	-5.42
9887.939	H	54.41	45.53	74	54	-19.59	-8.47

All emissions not reported were more than 20dB below the specified limit or in the noise floor.

Note: (1) All Readings are Peak Value and AV.

(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode:	802.11n TX (Channel 6)	Test Date :	April 20, 2013
Frequency Range:	Above 1GHz	Temperature :	28℃
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	LHZ

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
9863.411	V	56.46	45.18	74	54	-17.54	-8.82
10911.255	V	53.55	43.05	74	54	-20.46	-10.96
5189.128	H	57.19	48.64	74	54	-16.81	-5.36
5558.811	H	57.30	48.52	74	54	-16.70	-5.48
9657.679	H	53.18	45.67	74	54	-20.82	-8.33

All emissions not reported were more than 20dB below the specified limit or in the noise floor.

Note: (1) All Readings are Peak Value and AV.

(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3) Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode:	802.11n TX (Channel 11)	Test Date :	April 20, 2013
Frequency Range:	Above 1GHz	Temperature :	28℃
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	LHZ

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
5230.381	V	60.68	49.13	74	54	-13.32	-4.87
7269.485	V	57.57	47.26	74	54	-16.44	-6.75
8692.908	V	56.59	47.64	74	54	-17.41	-6.36
9942.711	V	53.99	44.74	74	54	-20.01	-9.26
7826.379	H	57.33	46.69	74	54	-16.67	-7.31
10019.244	H	57.05	44.95	74	54	-16.95	-9.05

No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.247.

Note: (1) All Readings are Peak Value and AV.

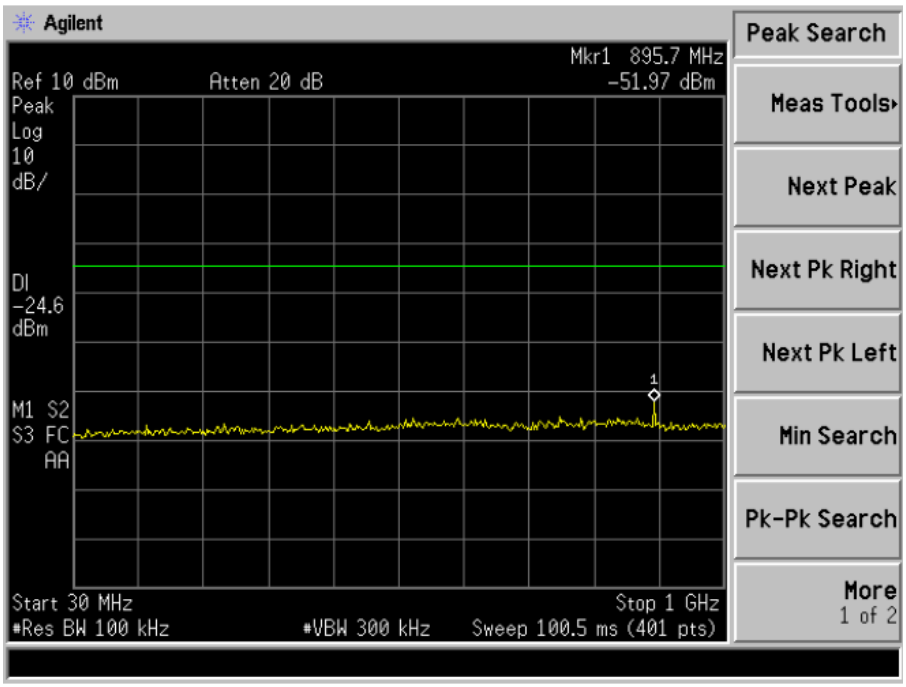
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

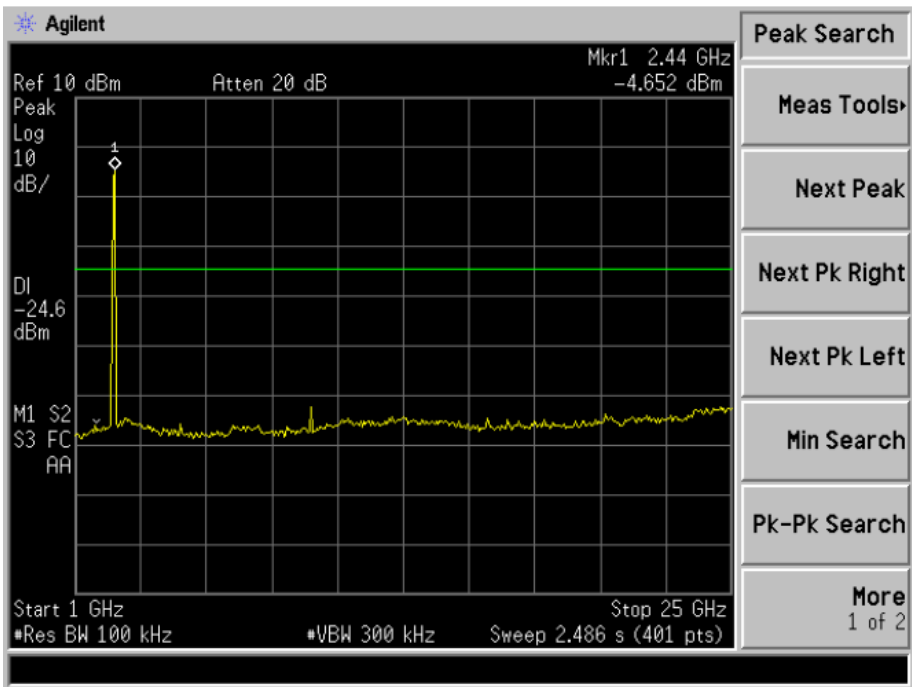
(3) Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Antenna port conducted spurious emissions

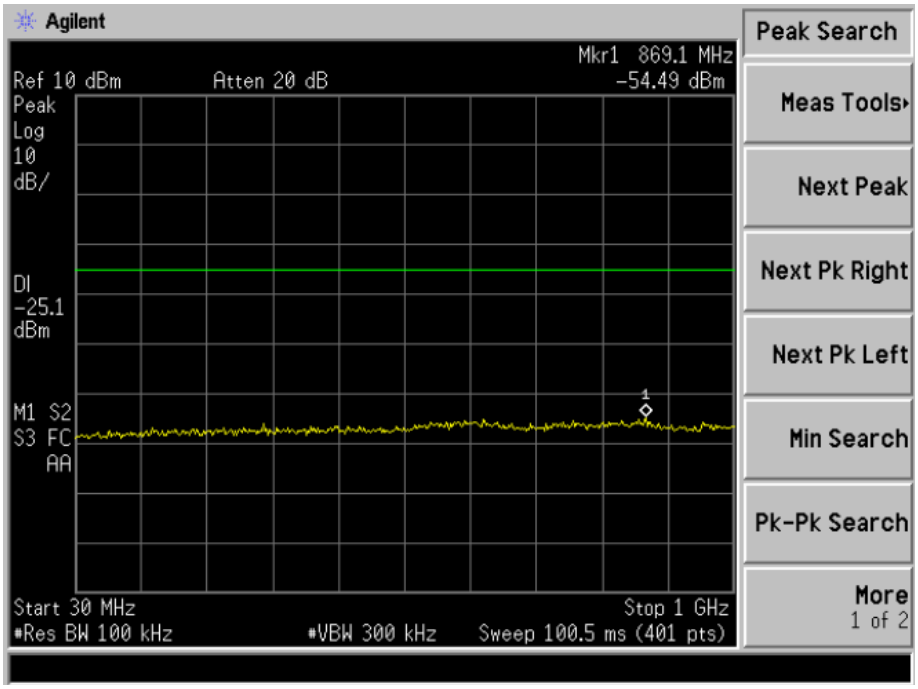
802.11b mode:

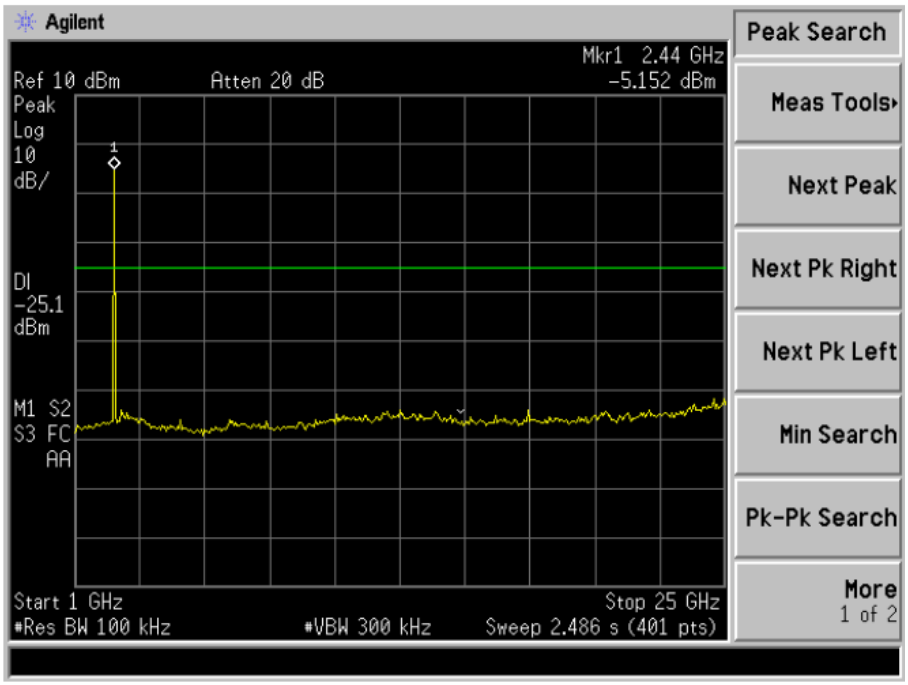
Low channel



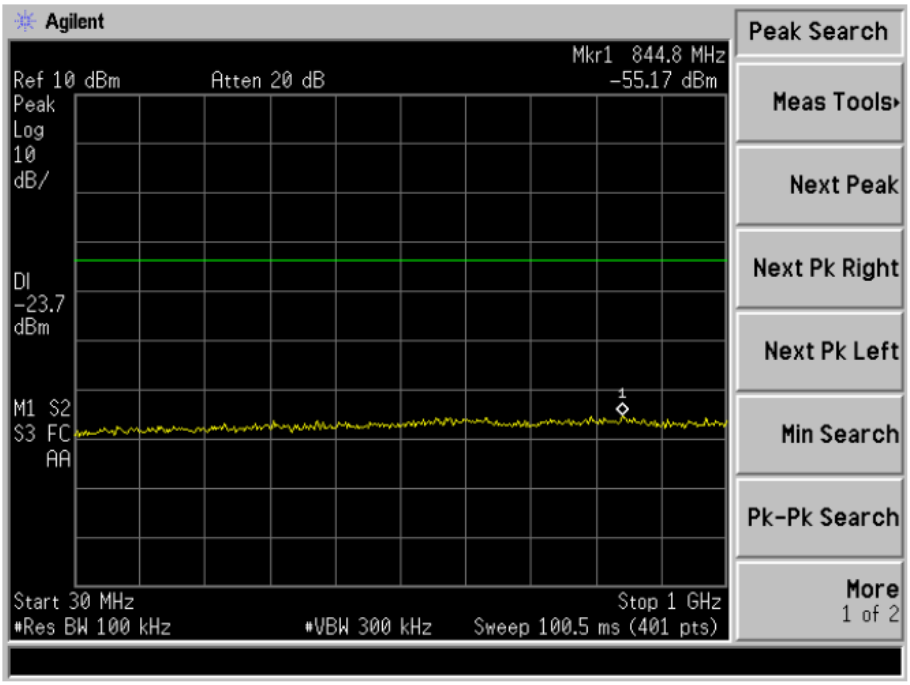


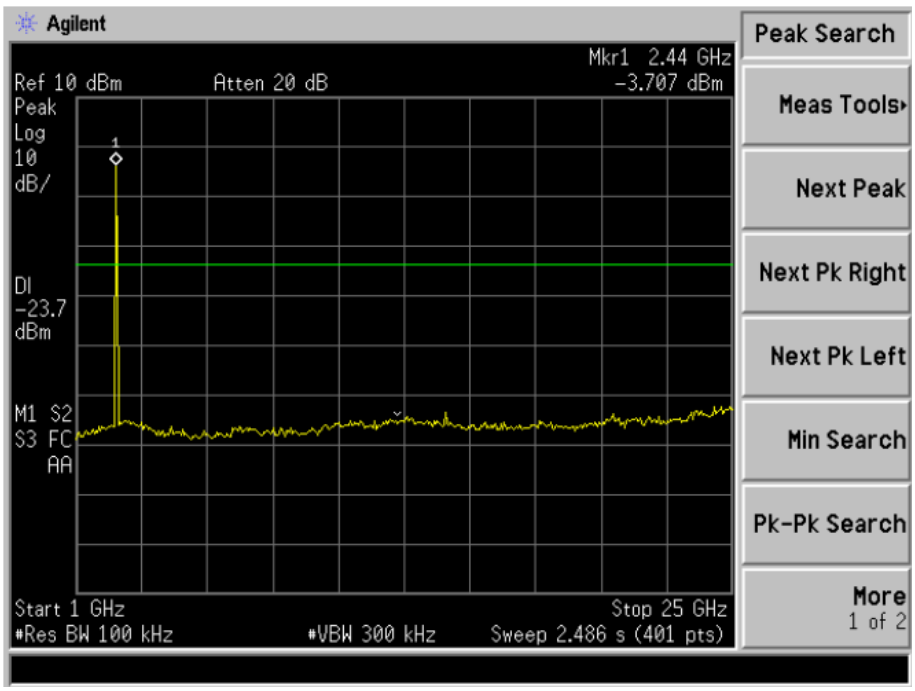
Middle channel





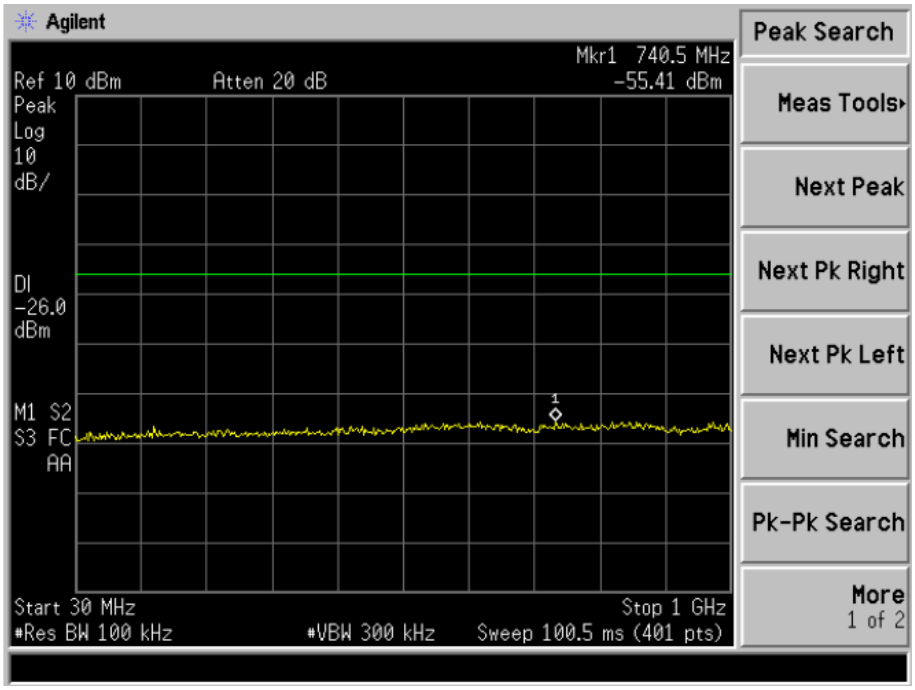
High channel

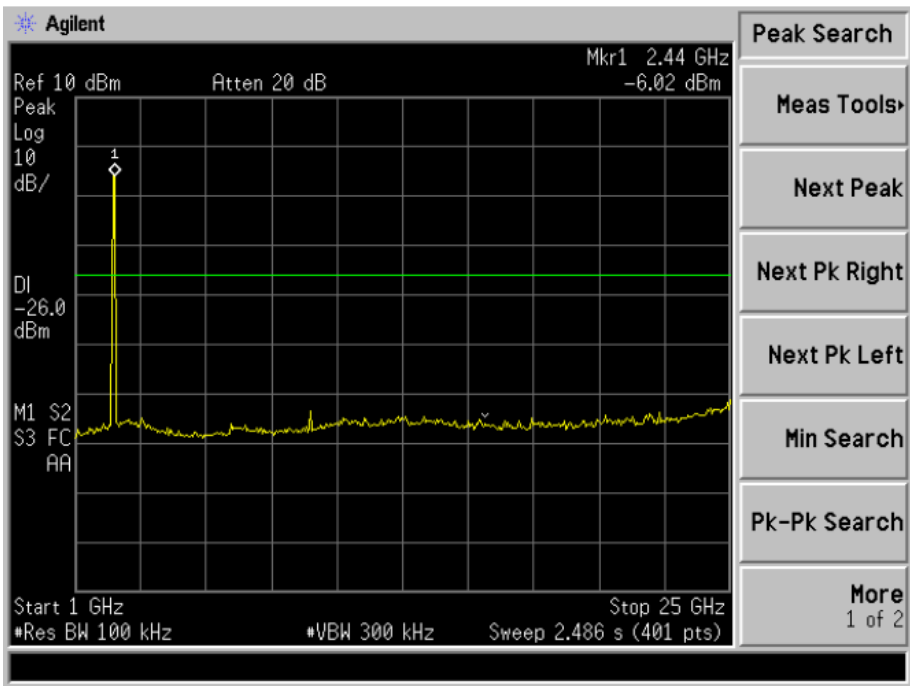




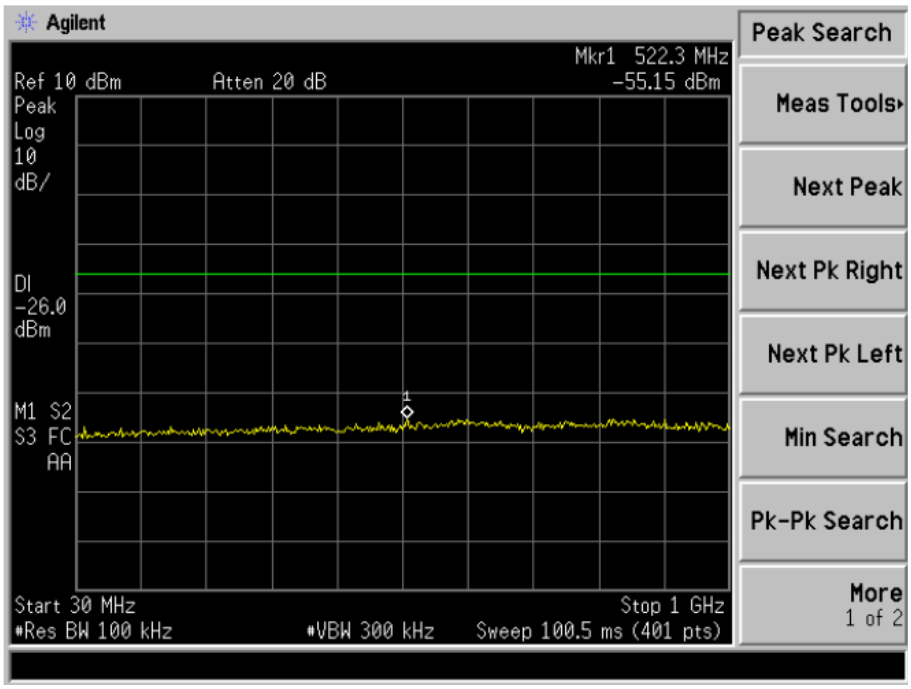
802.11g mode:

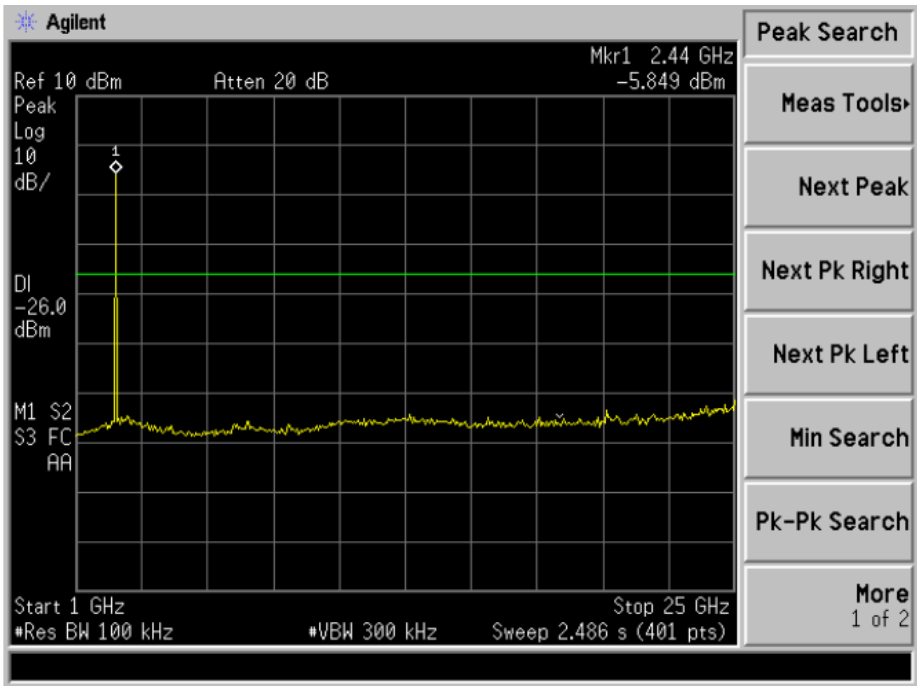
Low channel



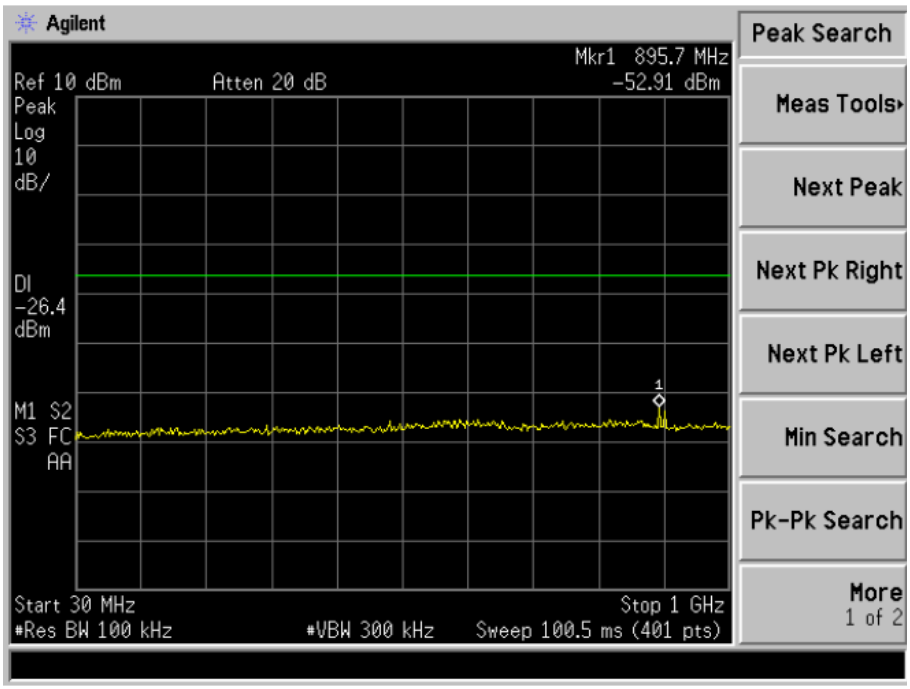


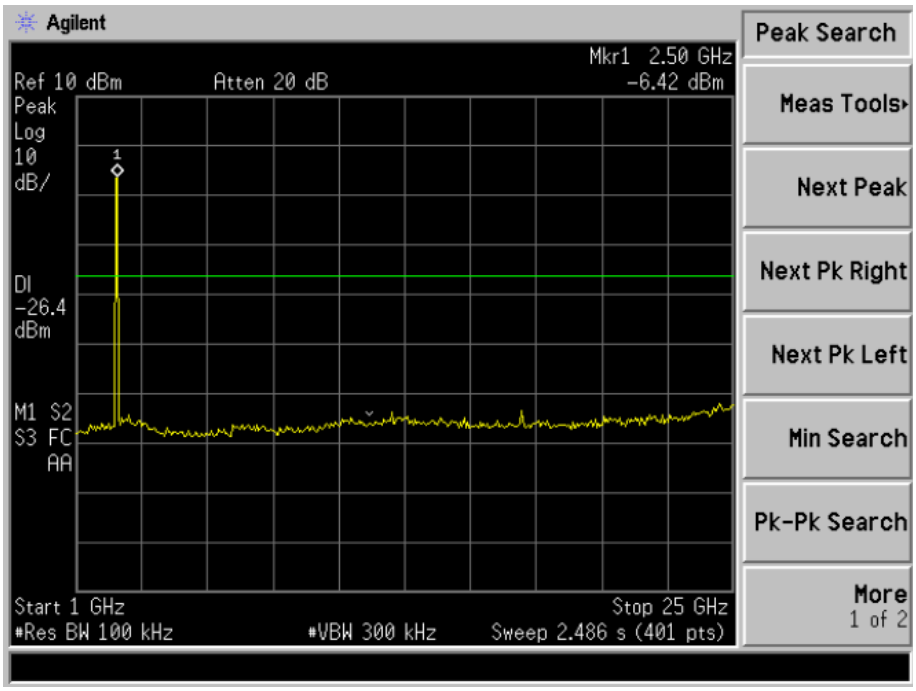
Middle channel





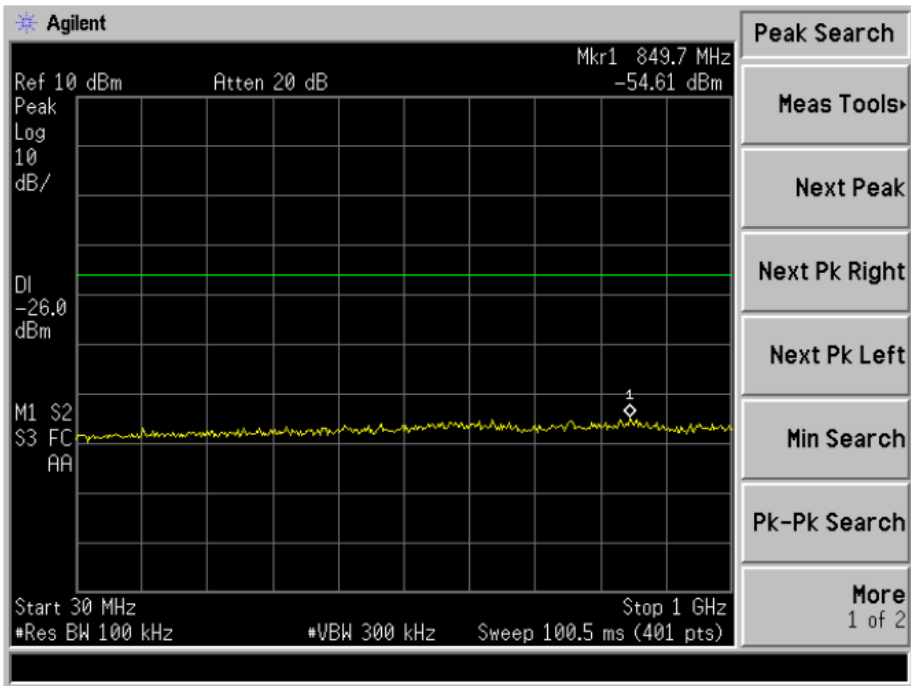
High channel

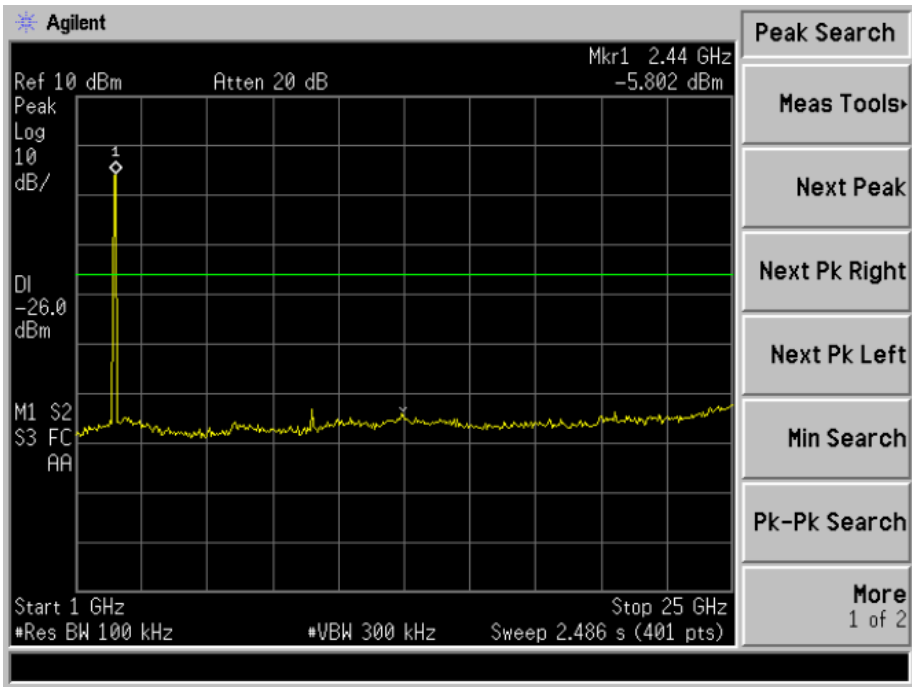




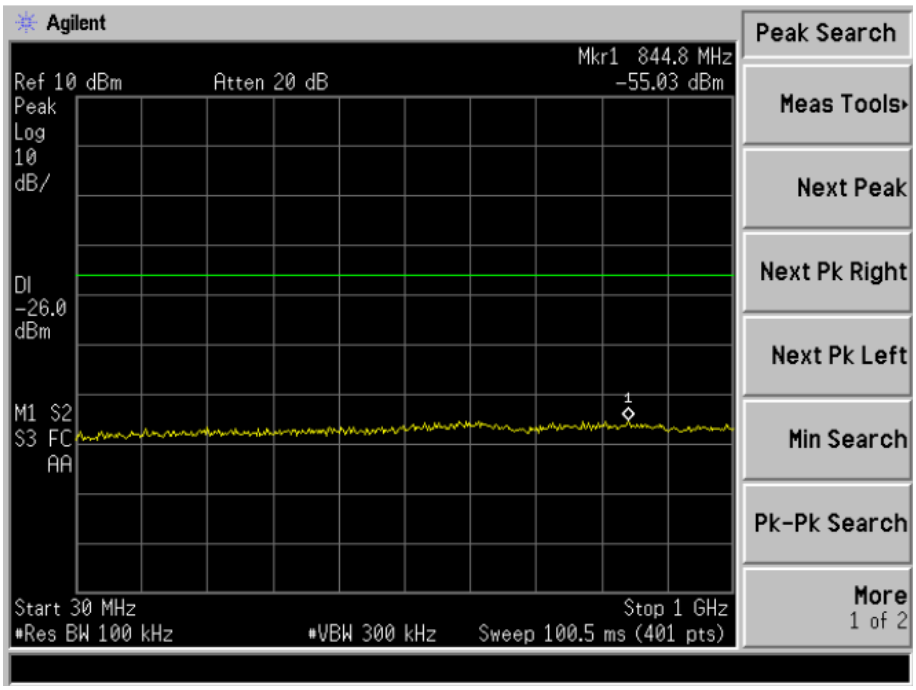
802.11n HT20 mode:

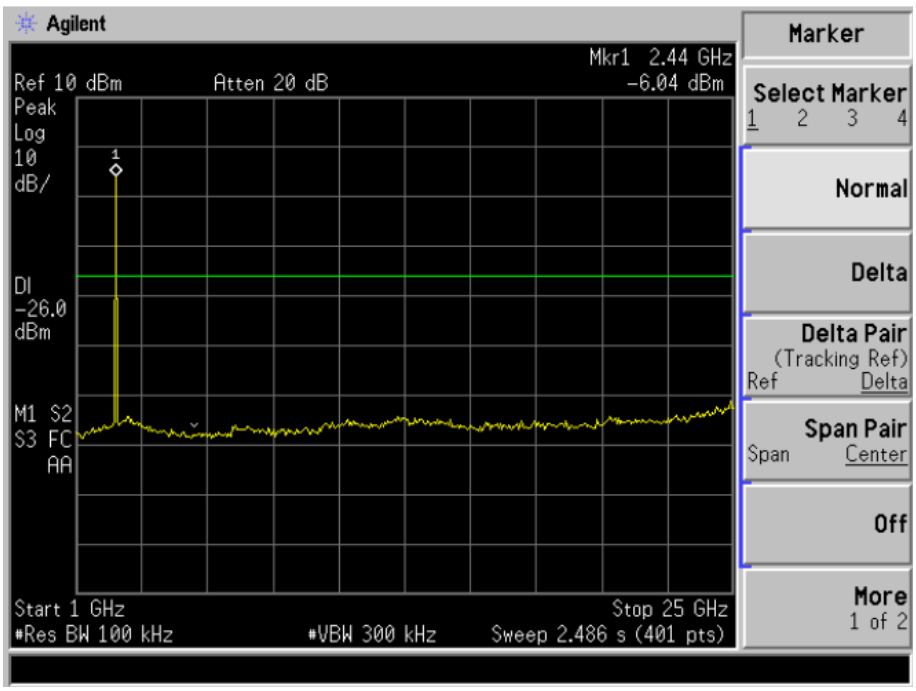
Low channel



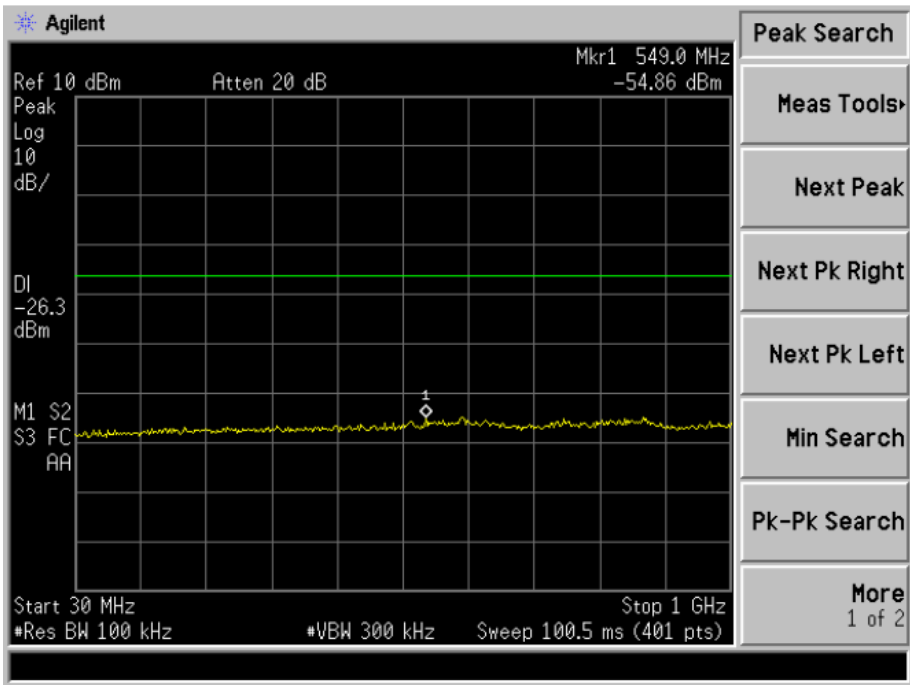


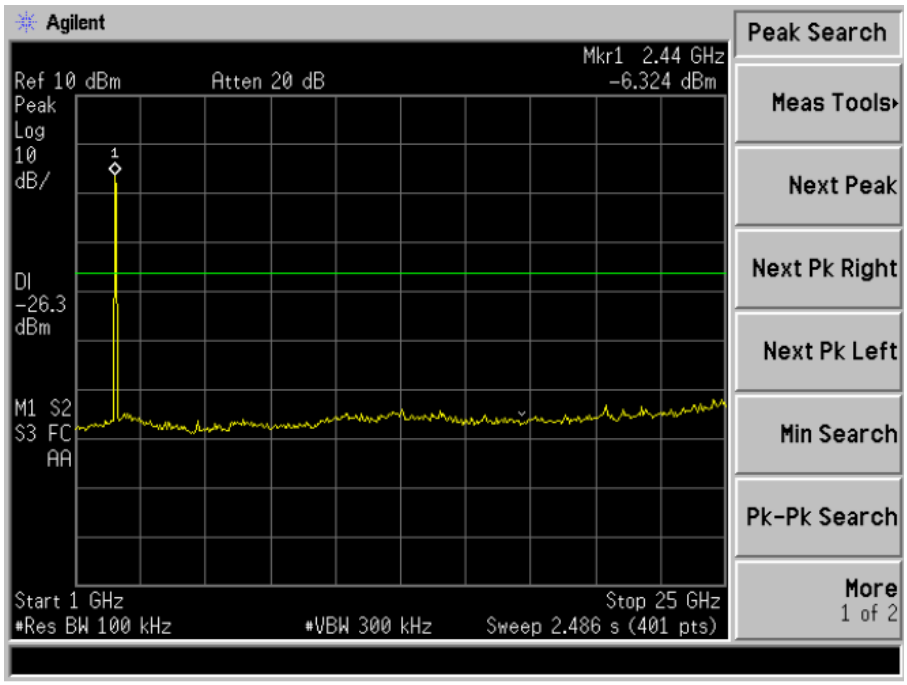
Middle channel





High channel





§15.247(a) (2) – 6dB BANDWIDTH TESTING

Test Equipment

Please refer to Section 4 this report.

Test Procedure

1. Set EUT in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=100KHz,VBW≥RBW, Span=40MHz,Sweep=auto.
4. Mark the peak frequency and -6dB(upper and lower)frequency.
5. Repeat until all the rest channels are investigated.

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	55%
ATM Pressure:	100.0kPa

Applicable Standard

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

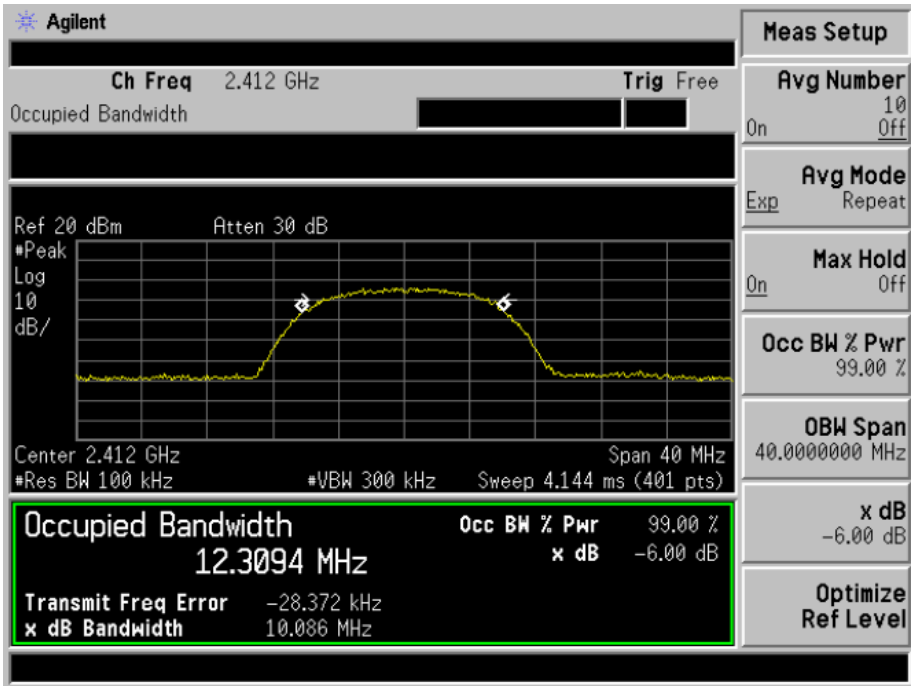
Test Result: Pass.

Please refer to the following tables

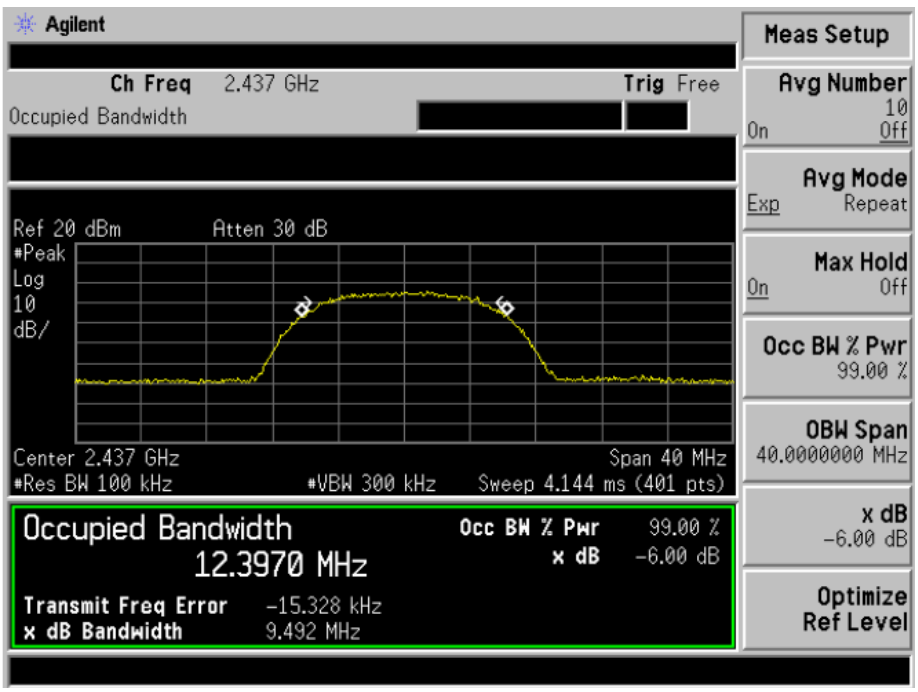
Channel Frequency (MHz)	Data Rate (Mbps)	6dB Bandwidth (kHz)	Limit (kHz)	Ref. Plot
802.11b Mode				
2412	1	10086	＞500	PLOT 1
2437	1	9492	＞500	PLOT 2
2462	1	9324	＞500	PLOT 3
802.11g Mode				
2412	6	16577	＞500	PLOT 4
2437	6	16560	＞500	PLOT 5
2462	6	16521	＞500	PLOT 6
802.11n HT20 Mode				
2412	6.5	17832	＞500	PLOT 7
2437	6.5	17760	＞500	PLOT 8
2462	6.5	17785	＞500	PLOT 9

802.11b Mode:

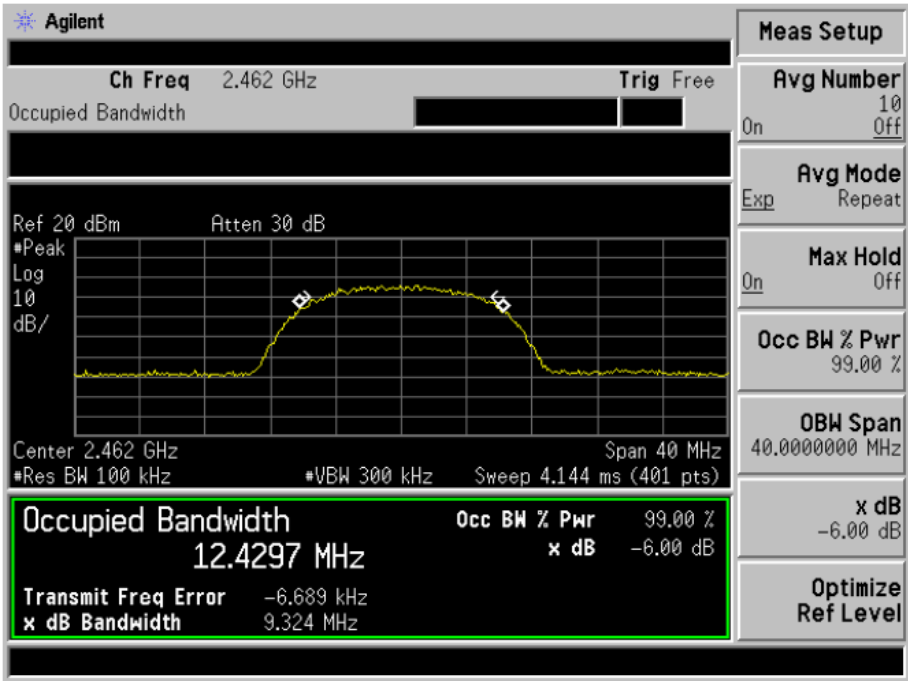
Low Channel



Middle channel

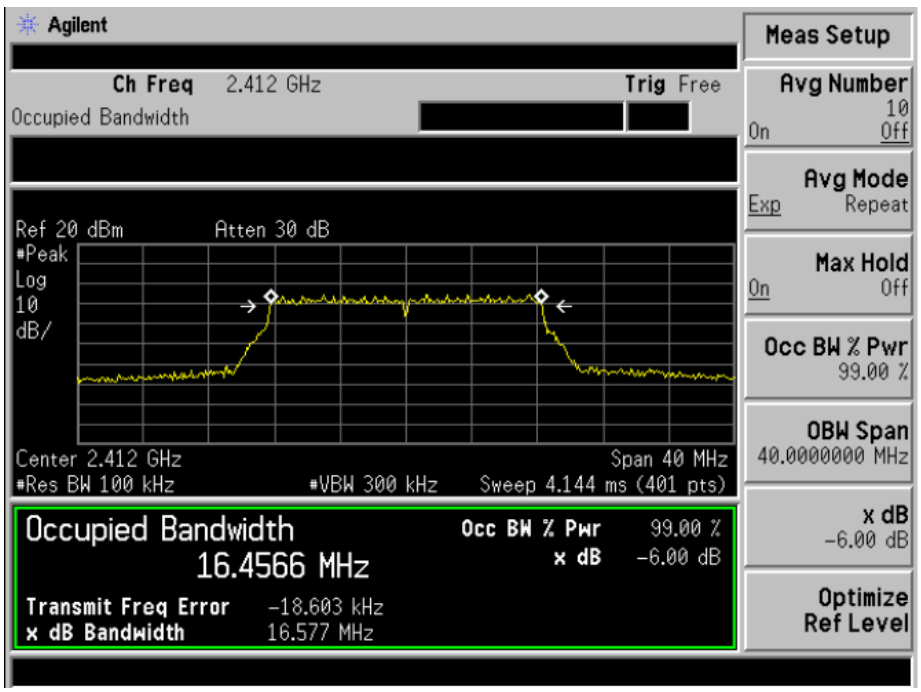


High Channel

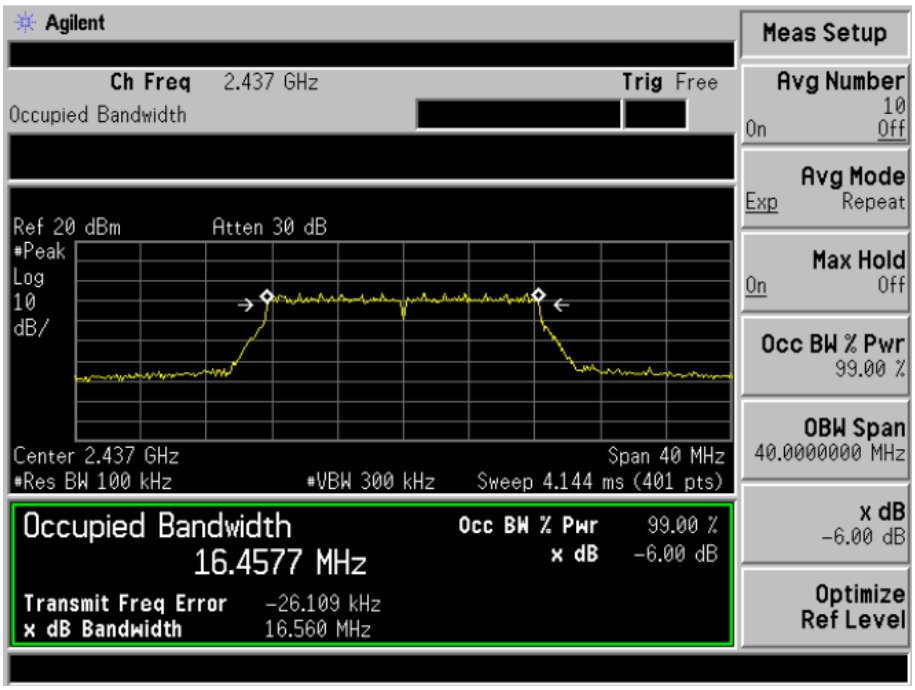


802.11g Mode:

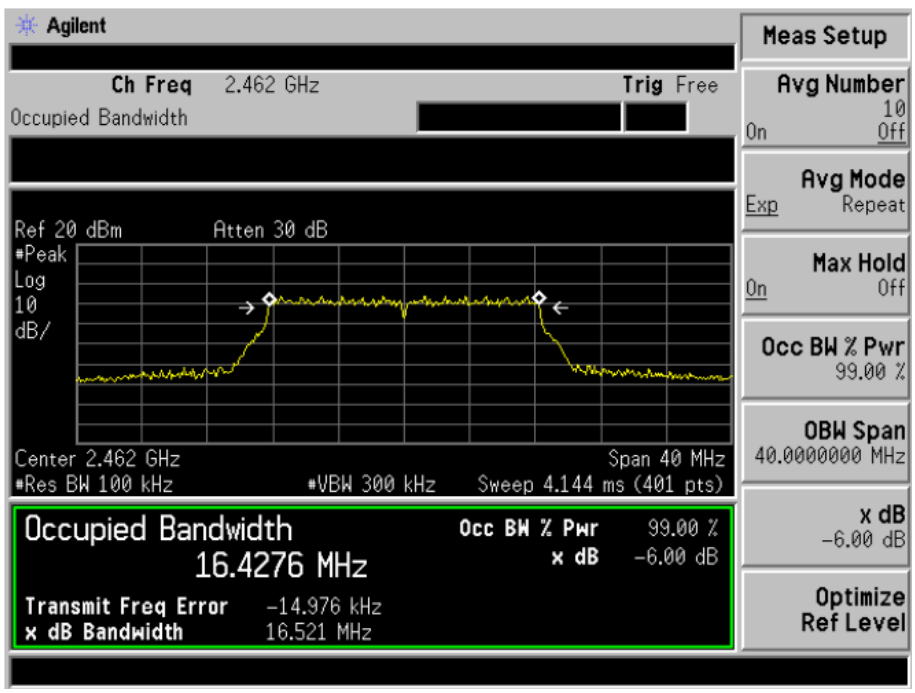
Low Channel



Middle Channel

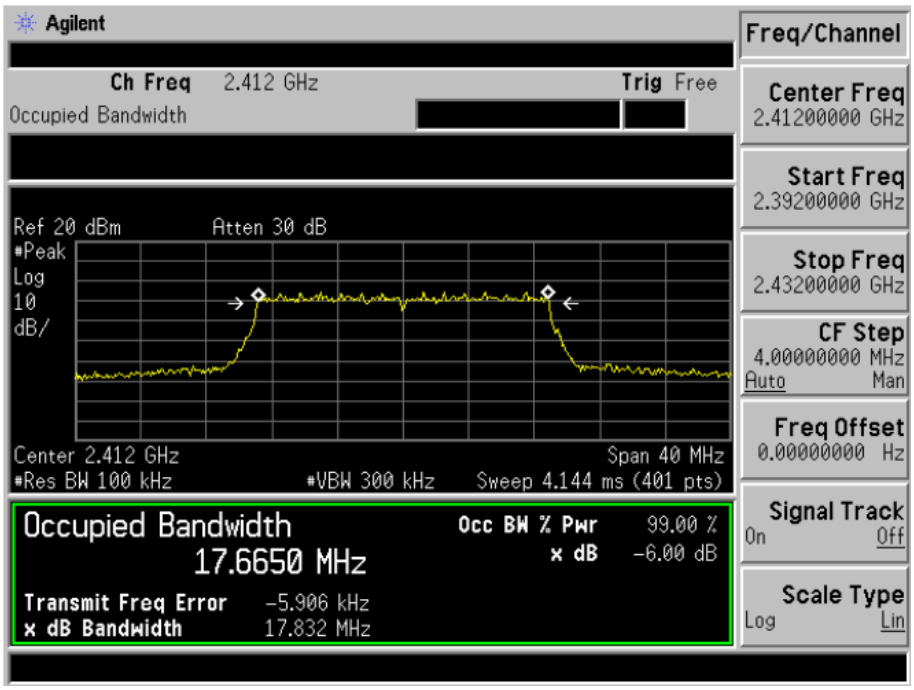


High Channel

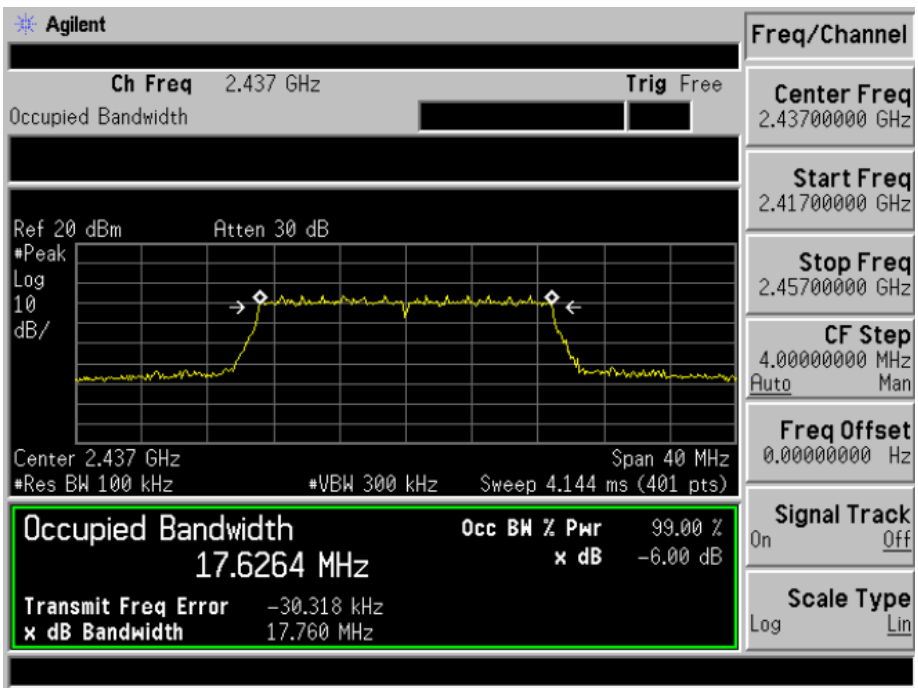


802.11n HT20 Mode:

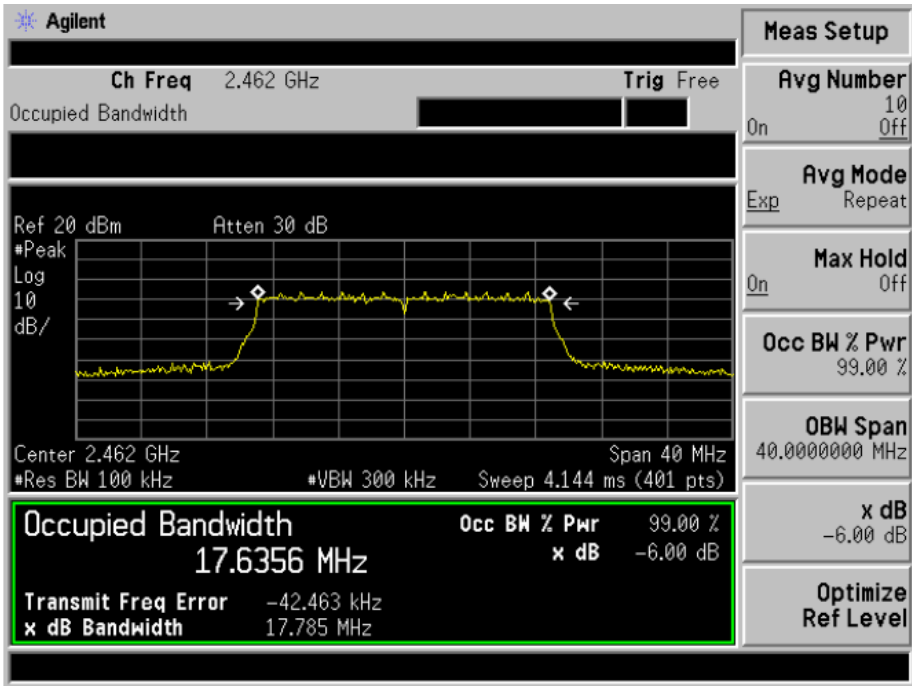
Low Channel



Middle Channel



High Channel



§15.247(b) (3) - MAXIMUM PEAK OUTPUT POWER

Test Equipment

Please refer to Section 4 this report.

Test Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set the RBW =1MHz, VBW ≧3RBW, span≧1.5*6dbbandwith.
   Sweep time = auto couple, Detector = peak, Trace mode = max hold.
4. Record the maximum power from the spectrum analyzer.
5. The maximum peak power shall be less 1 Watt (30dBm).

Note：The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	55%
ATM Pressure:	100.0kPa

Applicable Standard

According to §15.247(b) (3), for systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Test Result

802.11b Mode:

Channel	Frequency (MHz)	Data Rate (Mbps)	Conducted Power (dBm)	Limit (dBm)
Low	2412	1	**16.78**	30
Mid	2437	1	16.52	30
High	2462	1	16.61	30

802.11g Mode:

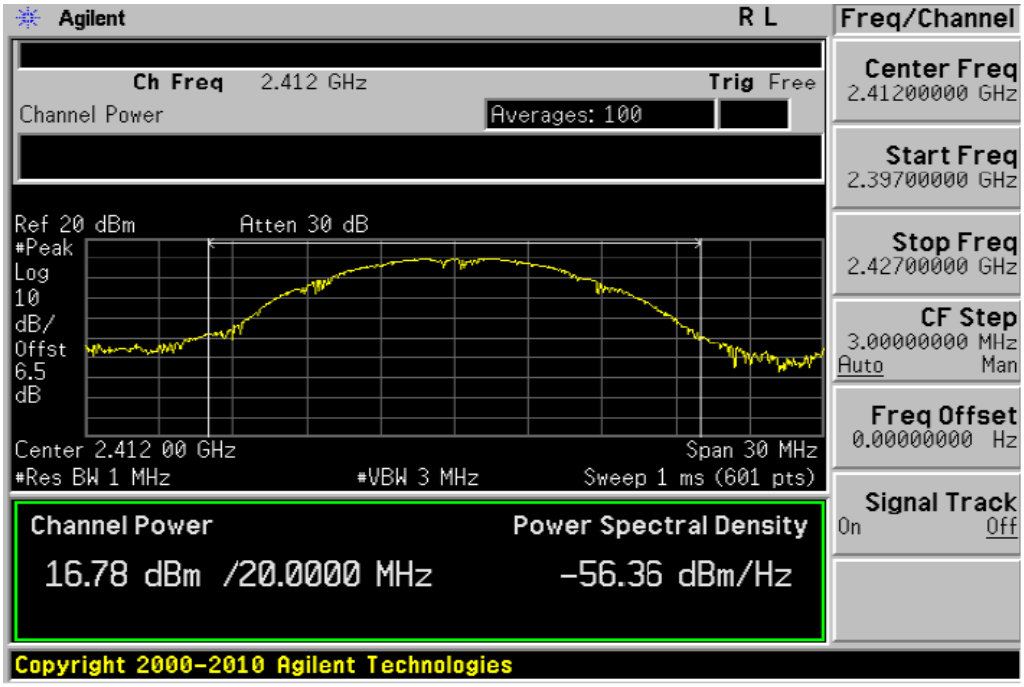
Channel	Frequency (MHz)	Data Rate (Mbps)	Conducted Power (dBm)	Limit (dBm)
Low	2412	6	15.72	30
Mid	2437	6	16.47	30
High	2462	6	**16.75**	30

802.11n HT20 Mode:

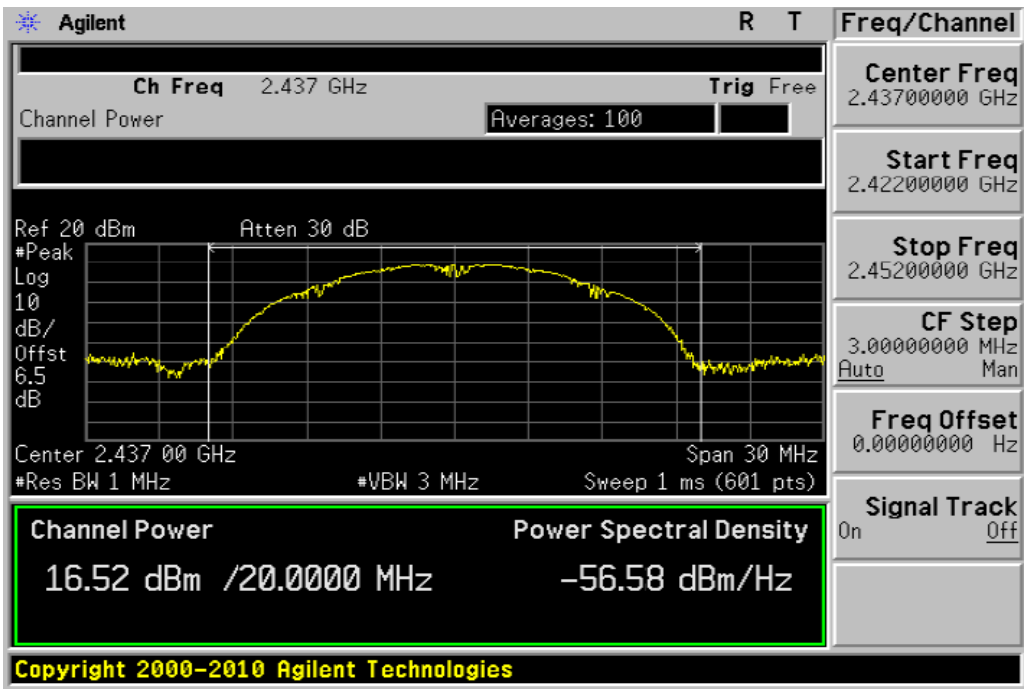
Channel	Channel Frequency (MHz)	Data Rate (Mbps)	Power Output (dBm)	Limit (dBm)
Low	2412	6.5	15.29	30
Mid	2437	6.5	**16.08**	30
High	2462	6.5	15.58	30

802.11b Mode:

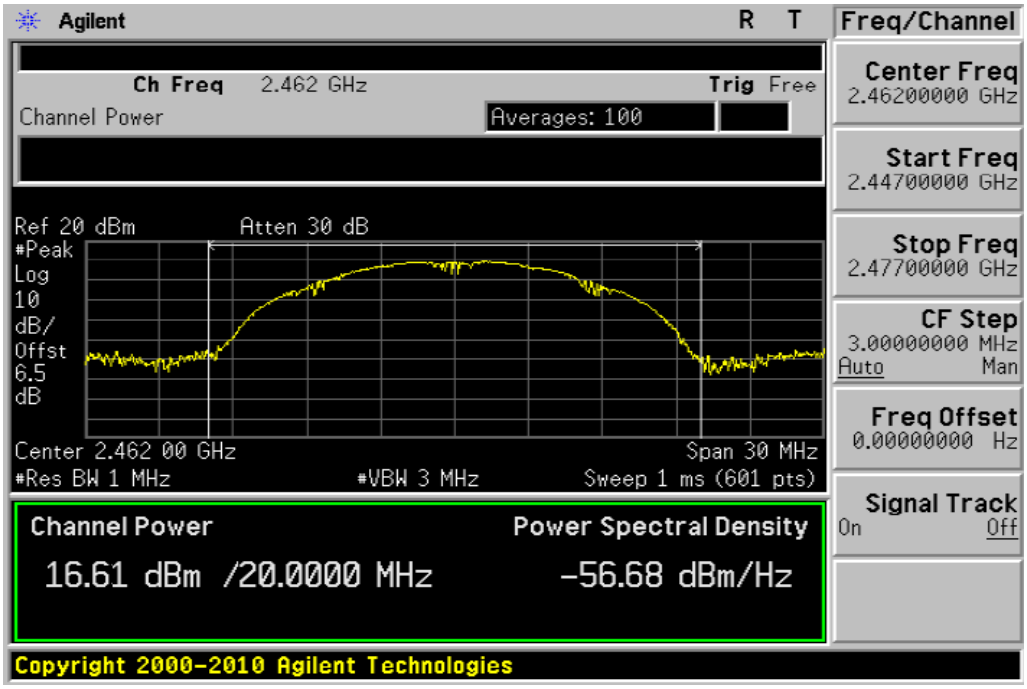
Low channel



Middle channel

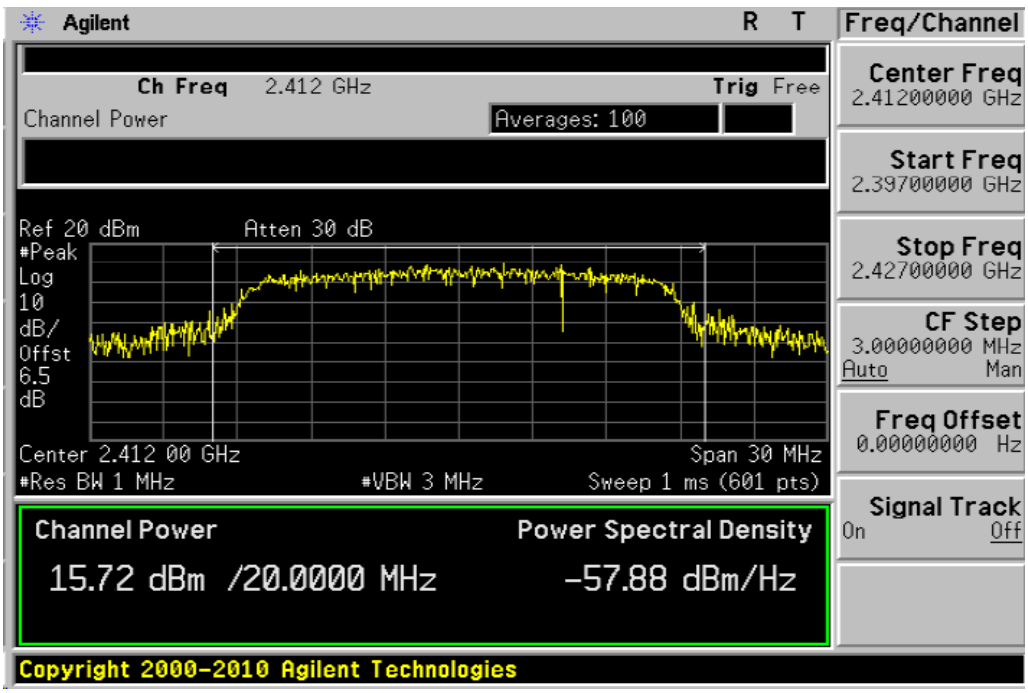


High channel

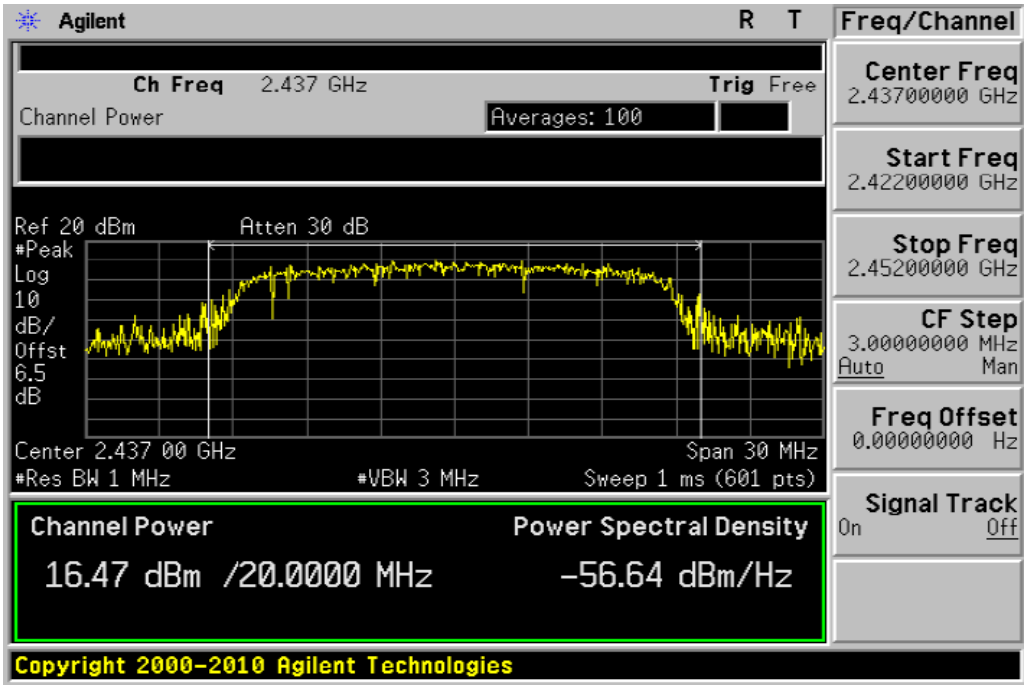


802.11g mode：

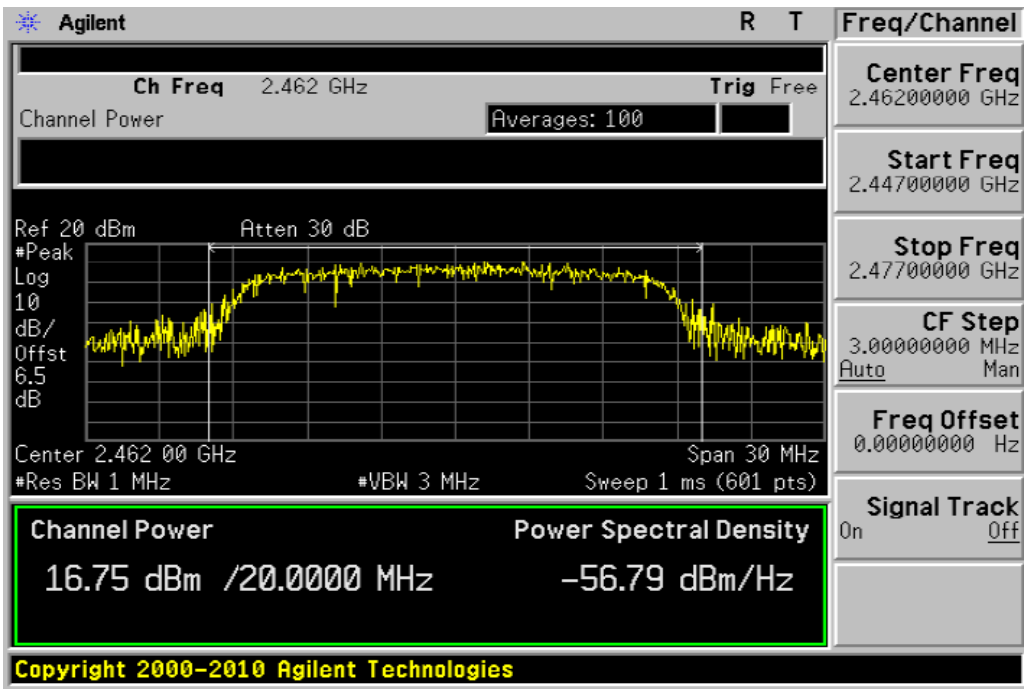
Low channel



Middle channel

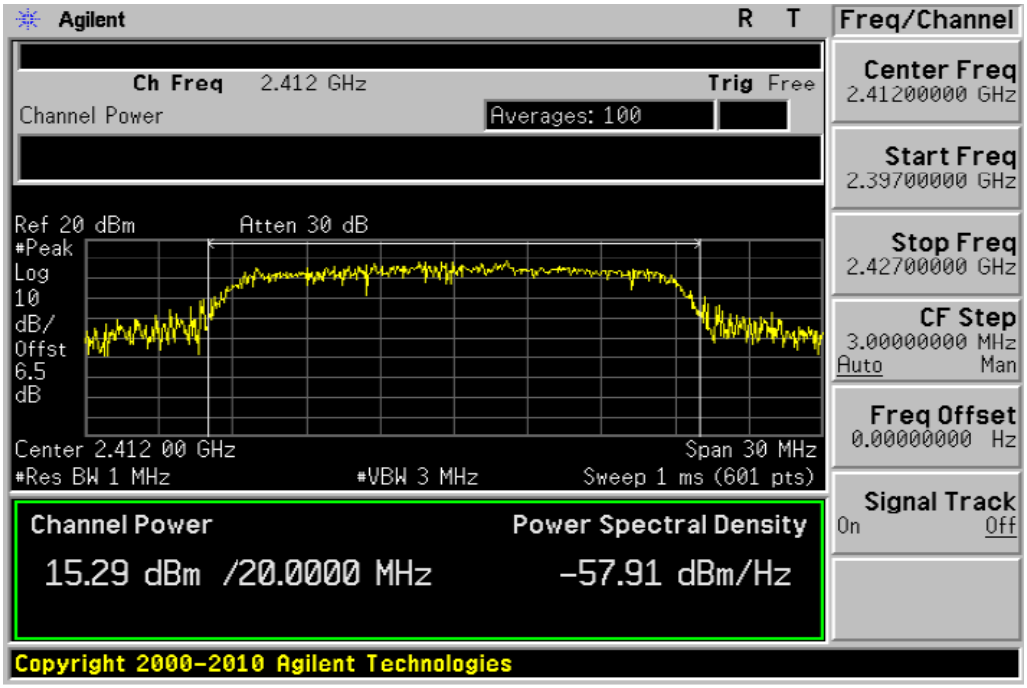


High channel

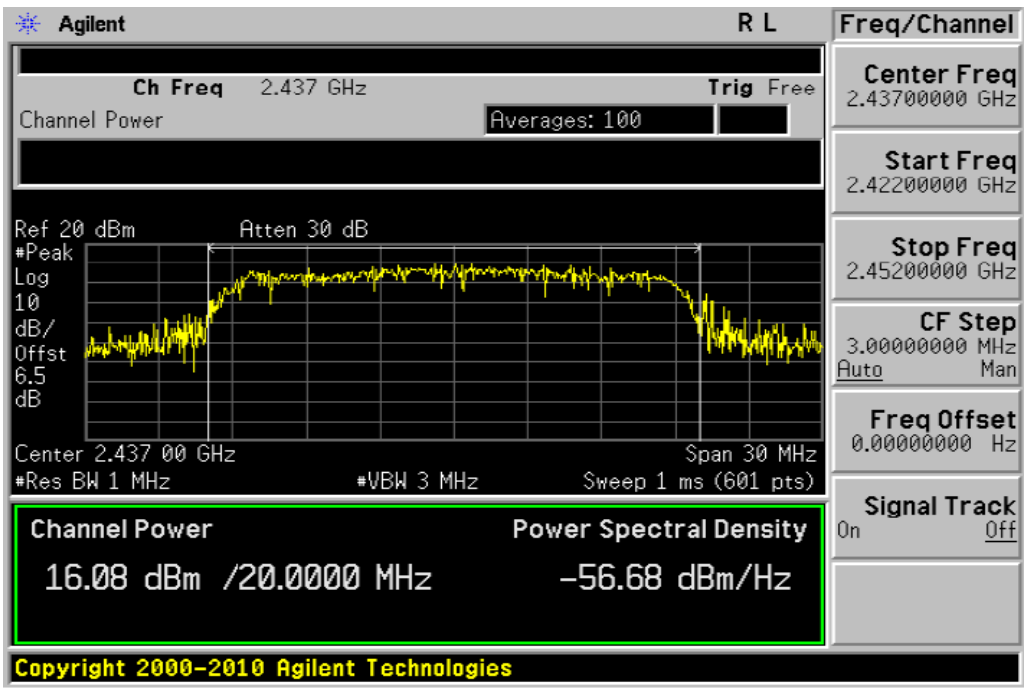


802.11n HT20 Mode:

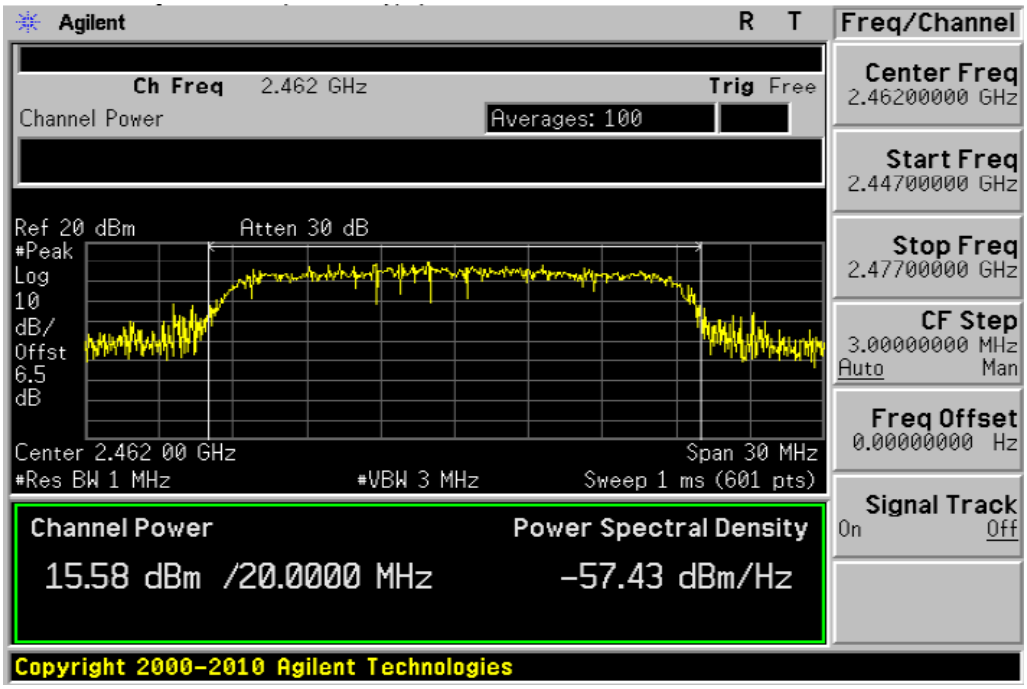
Low channel



Middle channel



High channel



§15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

Test Equipment

Please refer to Section 4 this report.

Test Procedure

The out of band emission tests were performed in the 3-meter chamber test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC Part Subpart C limits.

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	55%
ATM Pressure:	100.0kPa

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Result

PASS

Radiated measurement:

802.11b

Indicated		result	Table	Antenna		Correction Factor			FCC Part 15.247		
Frequency (MHz)	Receiver Reading (dBμV/m)	(PK/AV)	Angle Degree	Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit dBμV/m)	Margin (dB)
Low Channel (2412MHz)											
2390	45.33	AV	250	1.2	V	30.3	4.1	33.1	46.63	54	7.37
2390	45.44	AV	60	1.6	H	30.3	4.1	33.1	46.74	54	7.26
2390	55.63	PK	180	1.3	V	30.3	4.1	33.1	56.93	74	17.07
2390	55.86	PK	210	1.1	H	30.3	4.1	33.1	57.16	74	16.84
HighChannel (2462MHz)											
2483.5	36.91	AV	360	1.5	V	31	4.4	32.7	39.61	54	14.39
2483.5	37.85	AV	45	1.5	H	31	4.4	32.7	40.55	54	13.45
2483.5	46.58	PK	0	1.4	V	31	4.4	32.7	49.28	74	24.72
2483.5	47.88	PK	200	1.4	H	31	4.4	32.7	50.58	74	23.42

802.11g

Indicated		result	Table	Antenna		Correction Factor			FCC Part 15.247		
Frequency (MHz)	Receiver Reading (dBμV/m)	(PK/AV)	Angle Degree	Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low Channel (2412MHz)											
2390	39.47	AV	250	1.2	V	30.3	4.1	33.1	40.77	54	13.23
2390	46.92	AV	60	1.6	H	30.3	4.1	33.1	48.22	54	5.78
2390	54.35	PK	180	1.3	V	30.3	4.1	33.1	55.85	74	18.15
2390	64.63	PK	210	1.1	H	30.3	4.1	33.1	65.93	74	8.07
HighChannel (2462MHz)											
2483.5	39.22	AV	360	1.5	V	31	4.4	32.7	41.92	54	12.08
2483.5	43.71	AV	45	1.5	H	31	4.4	32.7	46.41	54	7.59
2483.5	55.50	PK	0	1.4	V	31	4.4	32.7	58.20	74	15.80
2483.5	59.91	PK	200	1.4	H	31	4.4	32.7	62.61	74	11.39

Note: the BAND EDGE RESTRICTED BANDS emission is too low at least 20dB to the Fundamental.

802.11n HT20

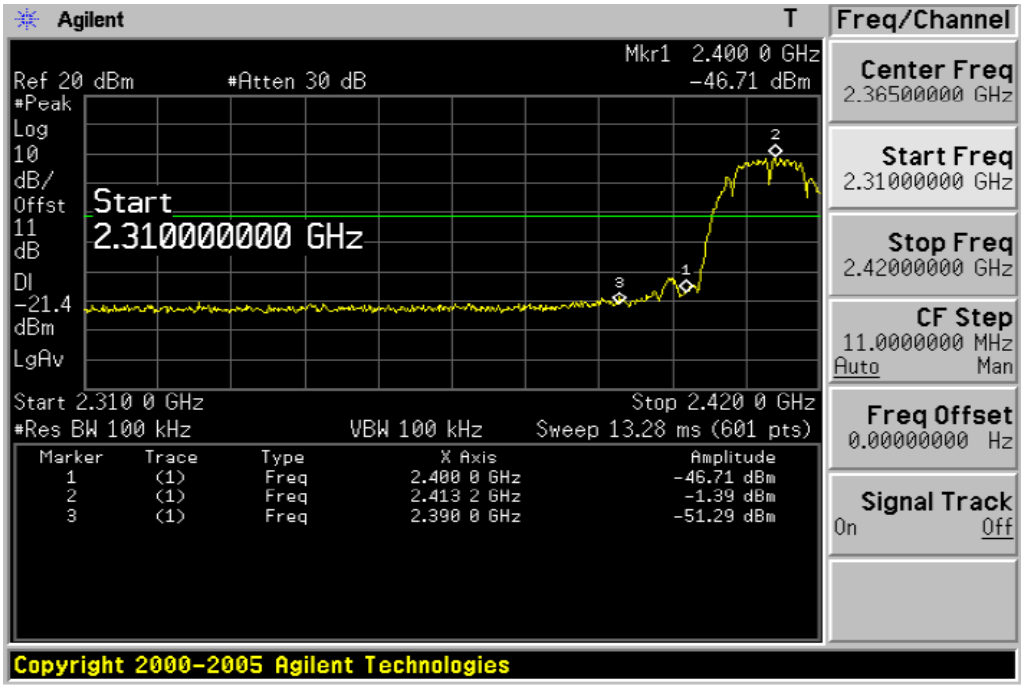
Indicated		result	Table	Antenna		Correction Factor			FCC Part 15.247		
Frequency (MHz)	Receiver Reading (dBμV/m)	(PK/AV)	Angle Degree	Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low Channel (2412MHz)											
2390	44.41	AV	250	1.2	V	30.3	4.1	33.1	45.71	54	8.29
2390	47.70	AV	60	1.6	H	30.3	4.1	33.1	49.00	54	5.00
2390	61.37	PK	180	1.3	V	30.3	4.1	33.1	62.67	74	11.33
2390	62.81	PK	210	1.1	H	30.3	4.1	33.1	64.11	74	9.89
HighChannel (2462MHz)											
2483.5	38.05	AV	360	1.5	V	31	4.4	32.7	40.75	54	13.25
2483.5	40.31	AV	45	1.5	H	31	4.4	32.7	43.01	54	10.99
2483.5	57.34	PK	0	1.4	V	31	4.4	32.7	60.04	74	13.96
2483.5	58.79	PK	200	1.4	H	31	4.4	32.7	61.49	74	12.51

Note: the BAND EDGE RESTRICTED BANDS emission is too low at least 20dB to the Fundamental.

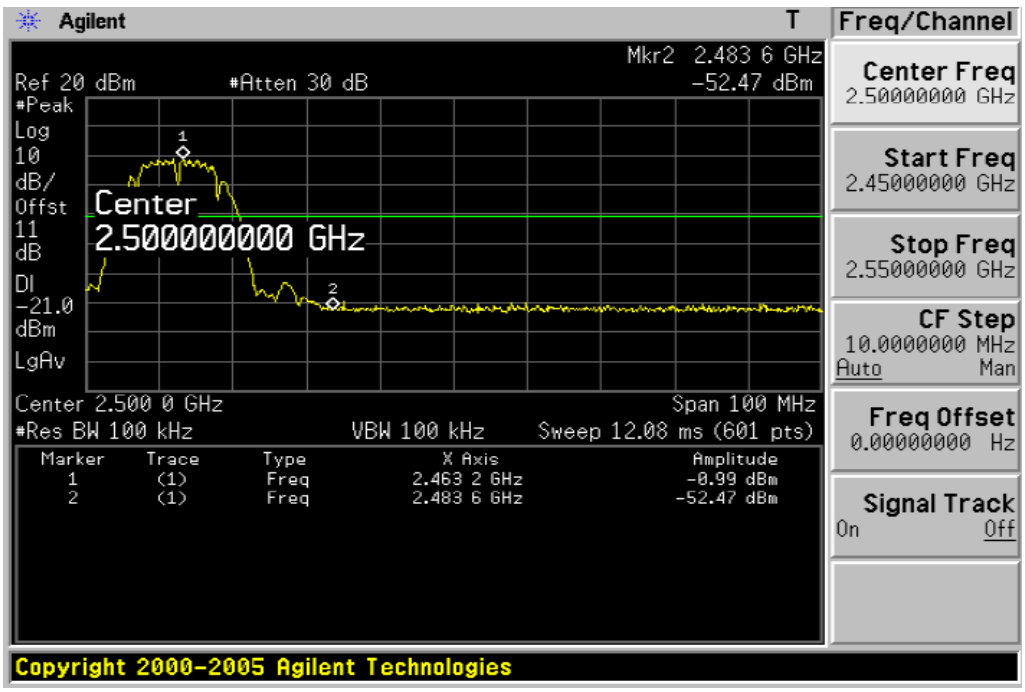
Conducted measurement:

802.11b

Low channel

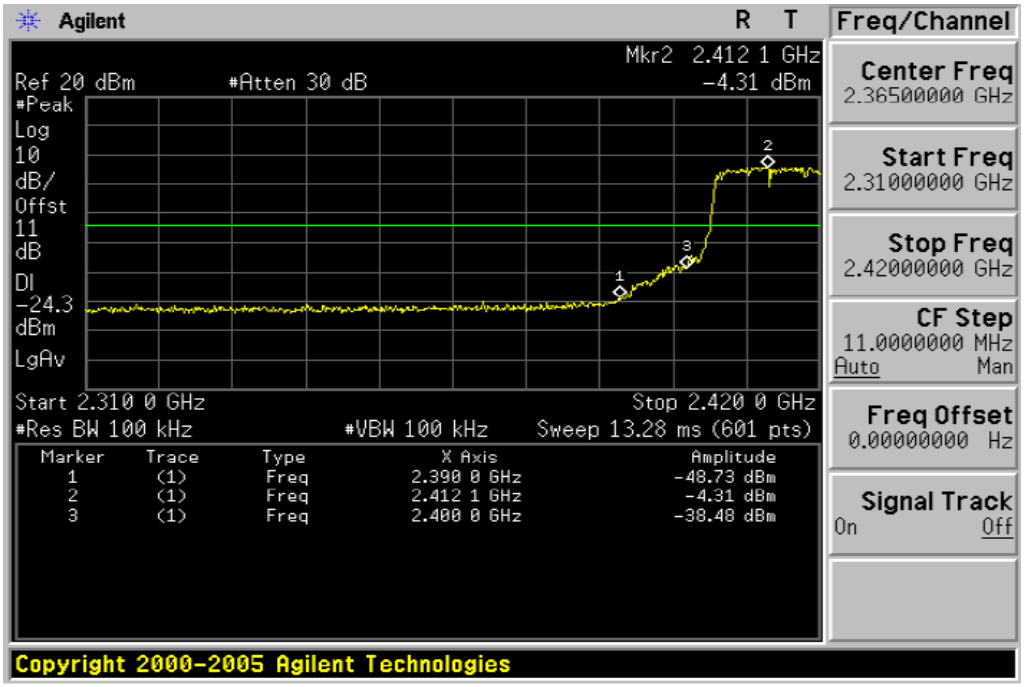


High channel

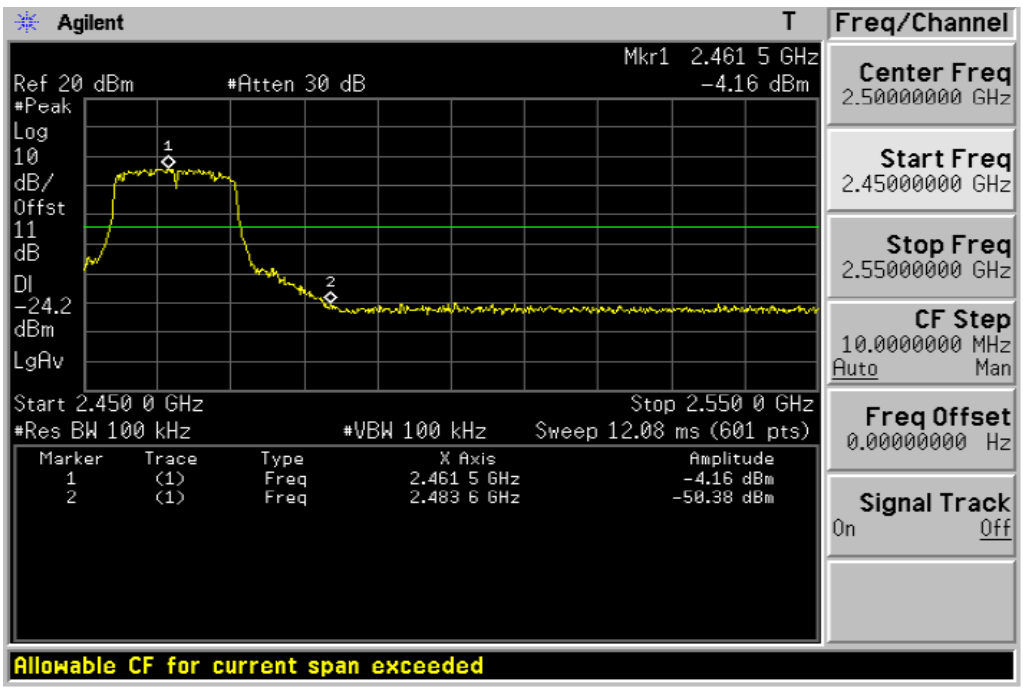


802.11g

Low channel

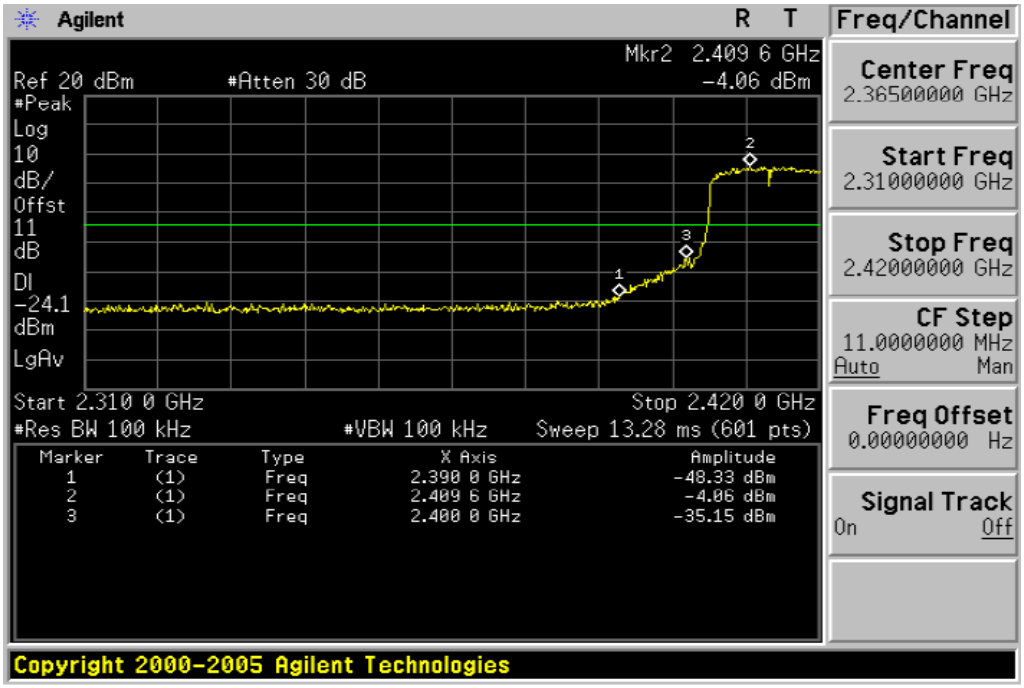


High channel

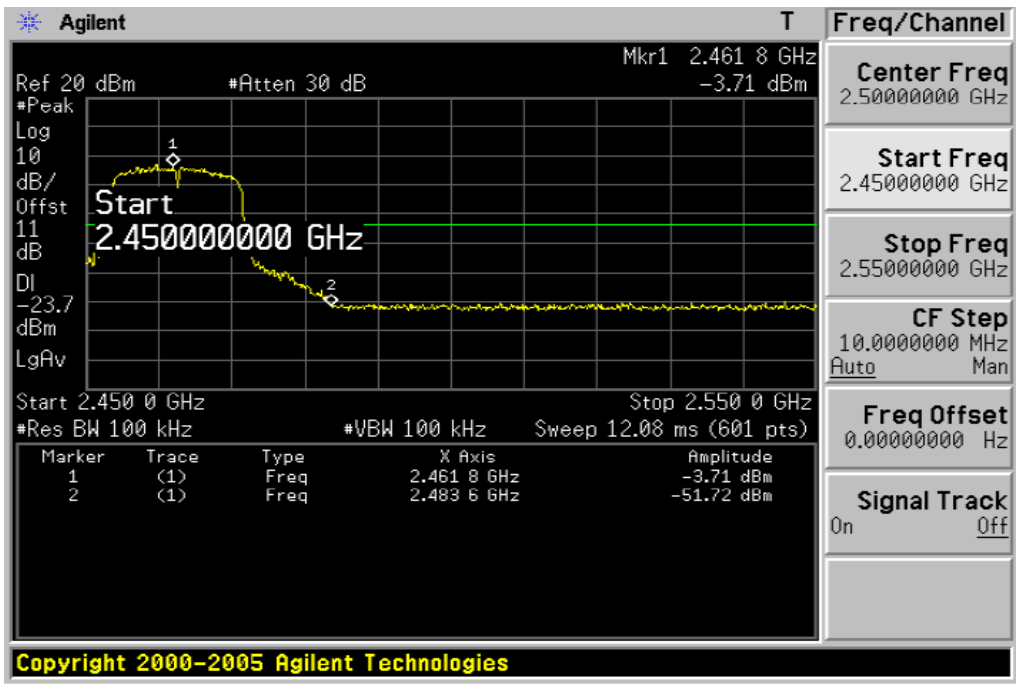


802.11n_HT20

Low channel



High channel



§15.247(e) -MAXIMUM CONDUCTED POWER SPECTRAL DENSITY

Test Equipment

Please refer to Section 4 this report.

Test Procedure

1, This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance, and is optional if the maximum conducted (average) output power was used to demonstrate compliance.
2, Set analyzer center frequency to DTS channel center frequency.
3, Set the RBW to:3 kHz ≦RBW ≦100 kHz, Set the VBW ≧3 RBW, Detector = peak. Sweep time = auto couple
4, Trace mode = max hold, Allow trace to fully stabilize.

Note：The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	55%
ATM Pressure:	100.0kPa

Applicable Standard

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

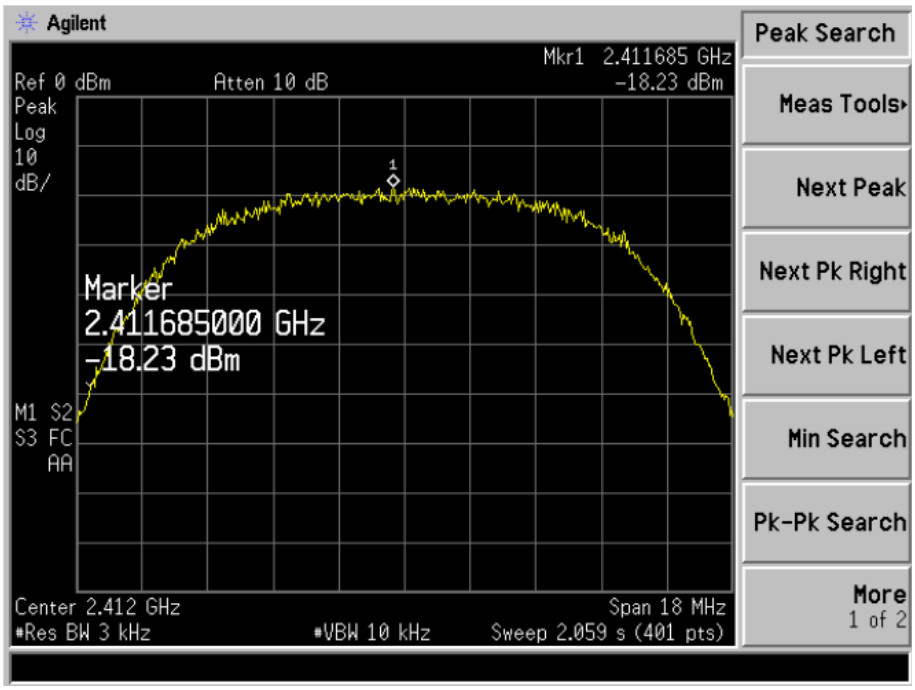
Test Result

PASS

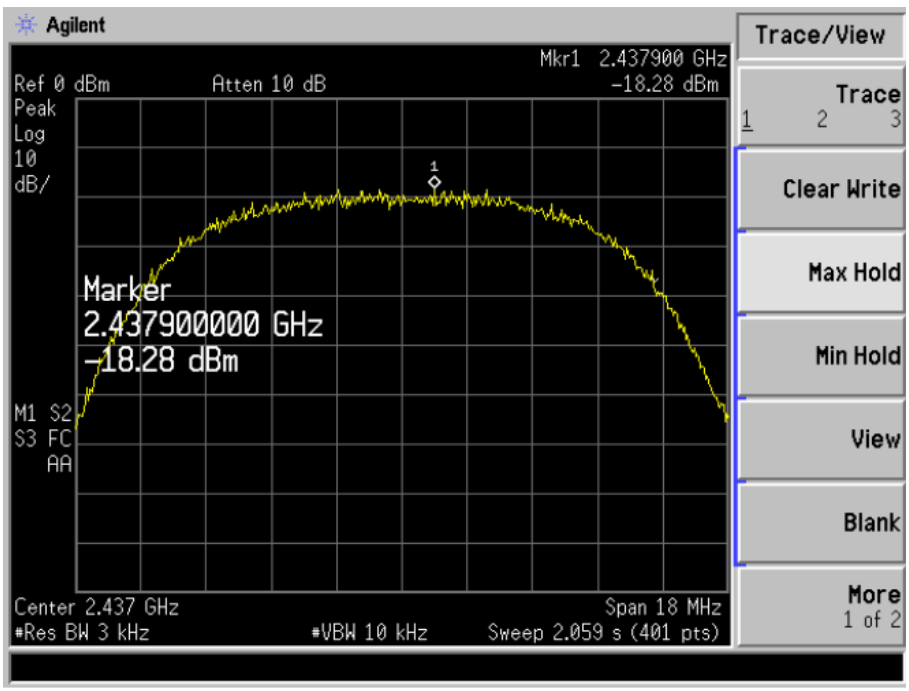
Channel Frequency (MHz)	Data Rate (Mbps)	PSD (dBm/3kHz)	Limit (dBm/3kHZ)	RESULT
802.11b Mode				
2412	1	-18.23	8	Compliant
2437	1	-18.28	8	Compliant
2462	1	-18.09	8	Compliant
802.11g Mode				
2412	6	-18.79	8	Compliant
2437	6	-19.86	8	Compliant
2462	6	-20.4	8	Compliant
802.11n HT20 Mode				
2412	6.5	-19.47	8	Compliant
2437	6.5	-19.24	8	Compliant
2462	6.5	-20.48	8	Compliant

802.11b Mode:

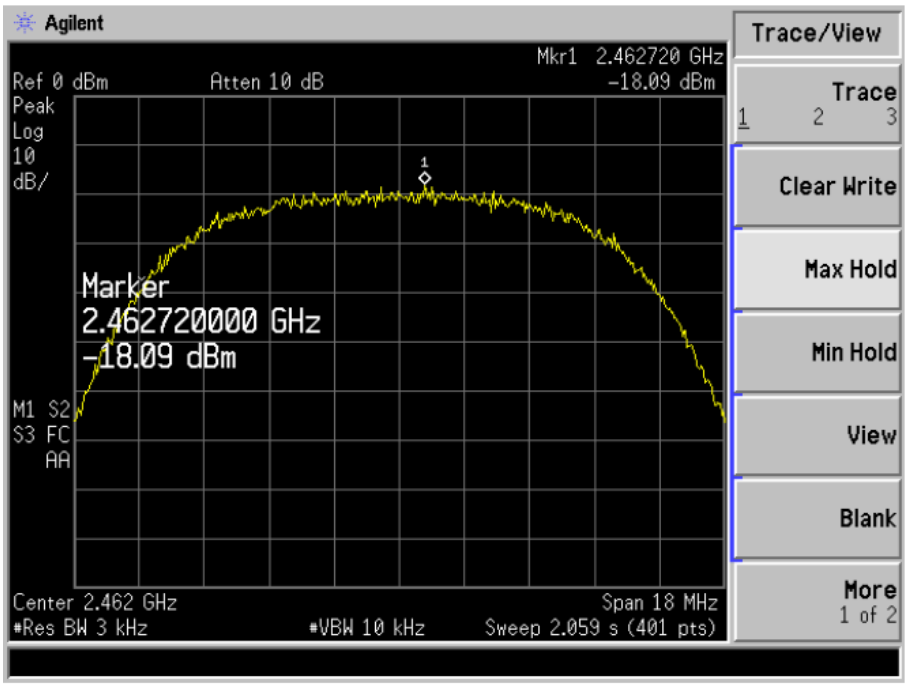
Low Channel



Middle Channel

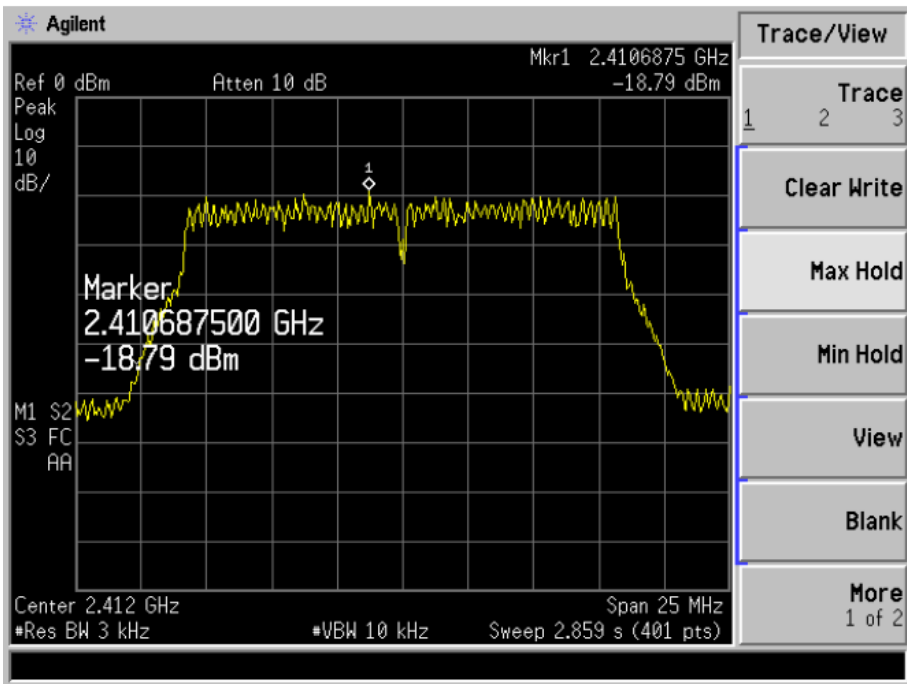


High Channel

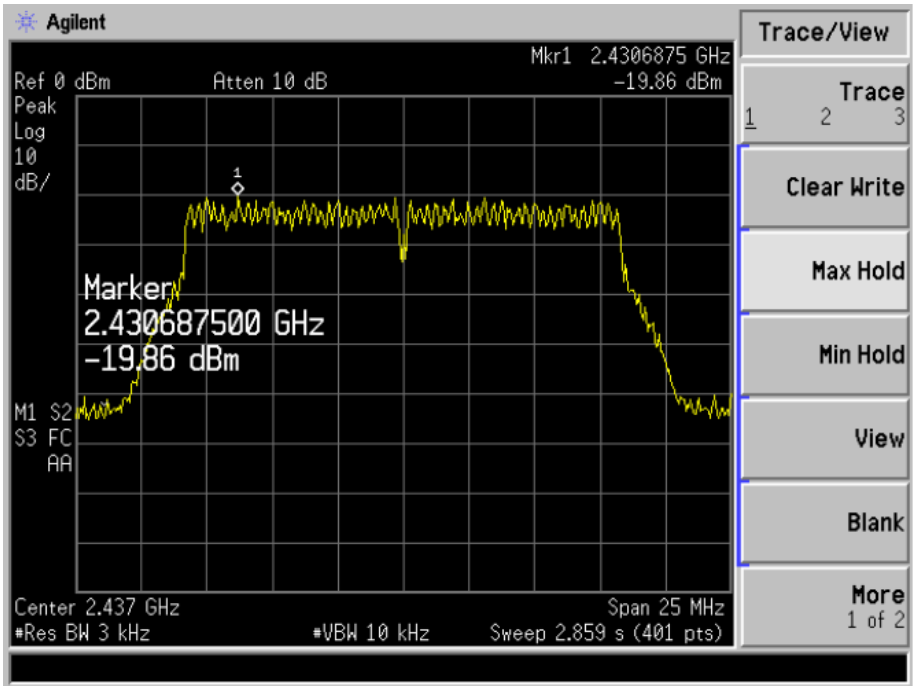


802.11g Mode:

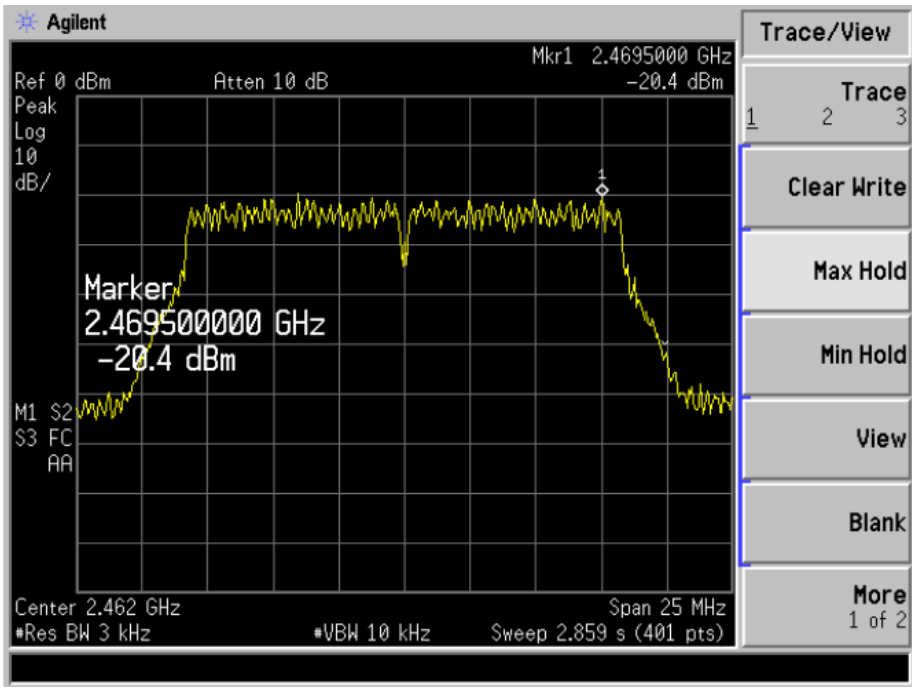
Low Channel



Middle Channel

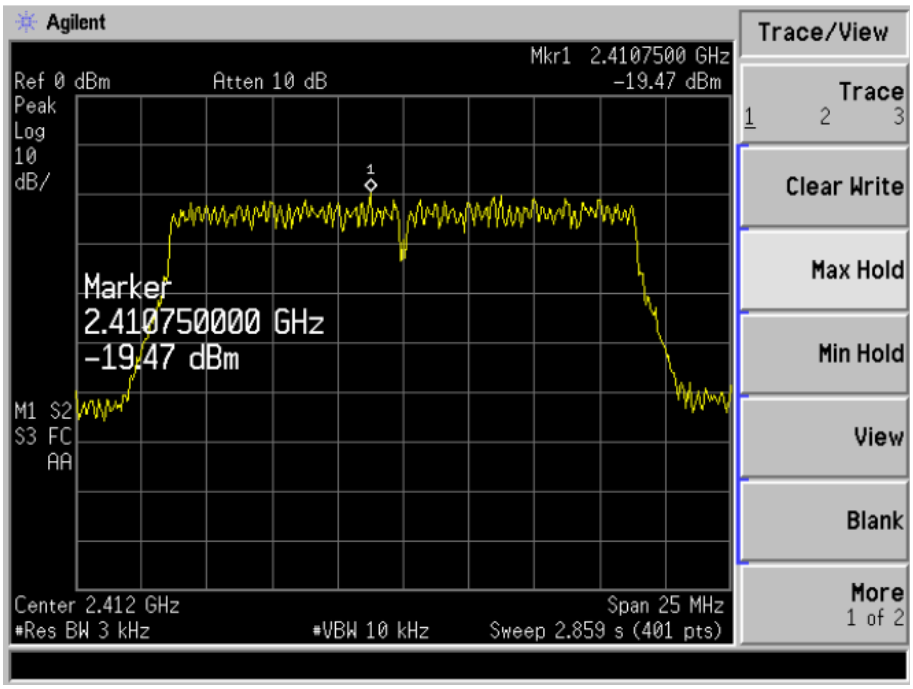


High Channel

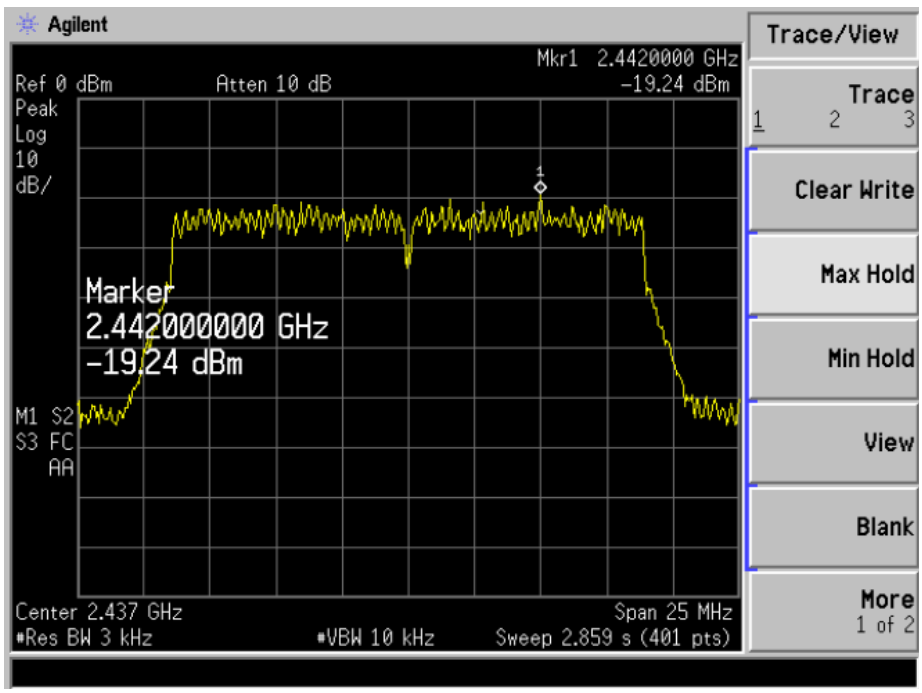


802.11n HT20 Mode:

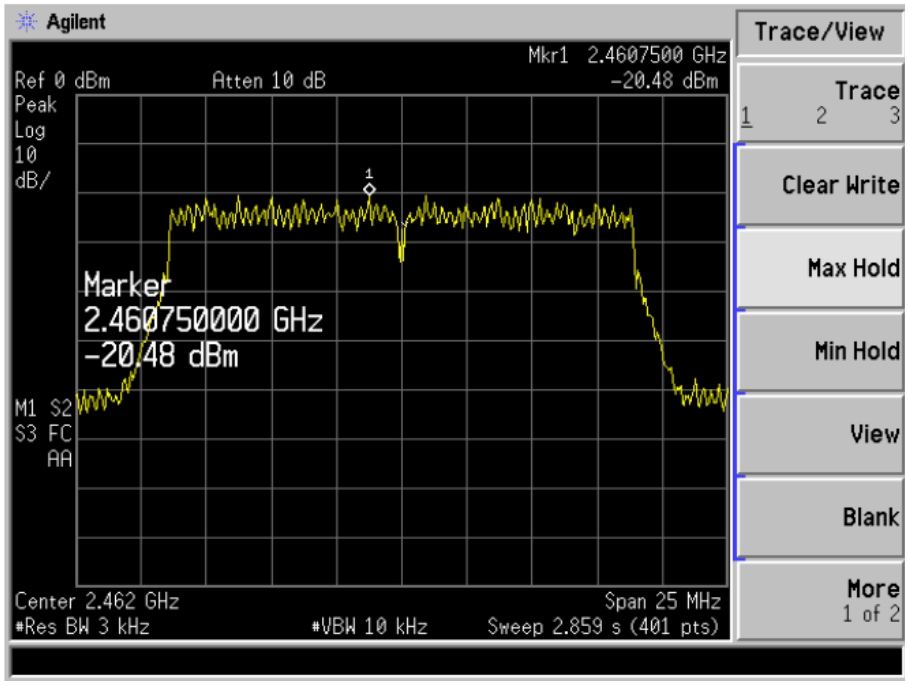
Low Channel



Middle Channel



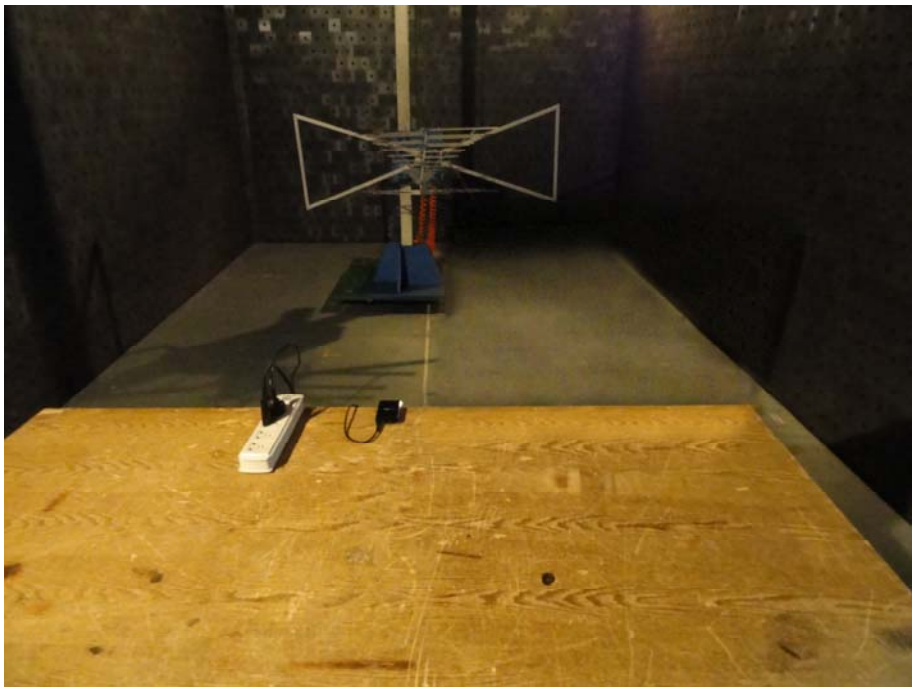
High Channel



PHOTOGRAPHS OF THE TEST CONFIGURATION

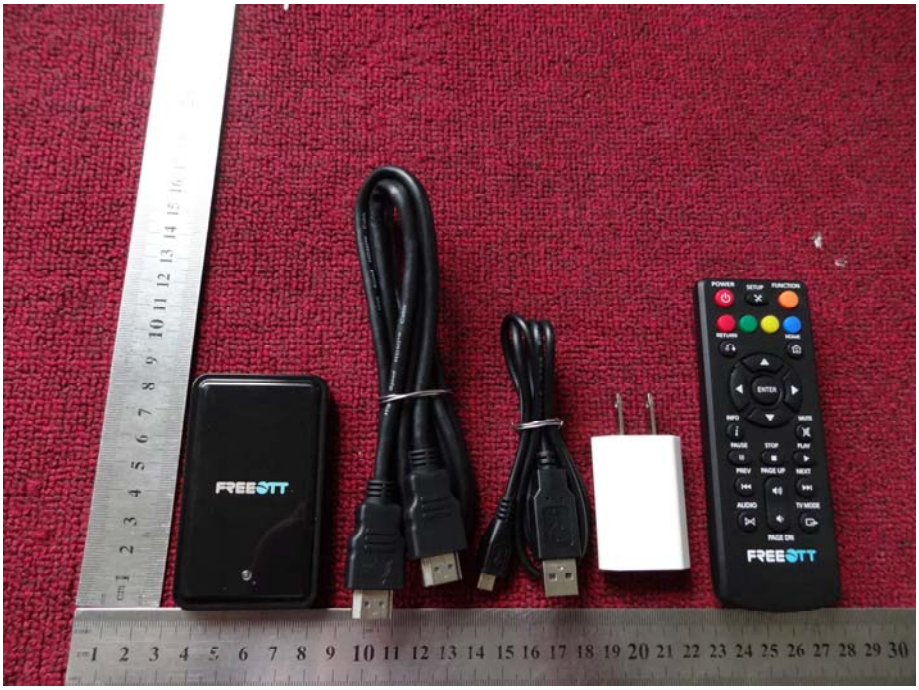
CONDUCTED EMISSION TEST

RADIATED EMISSION TEST



PHOTOGRAPHS OF EUT

Appearance photograph of EUT



Appearance photograph of EUT

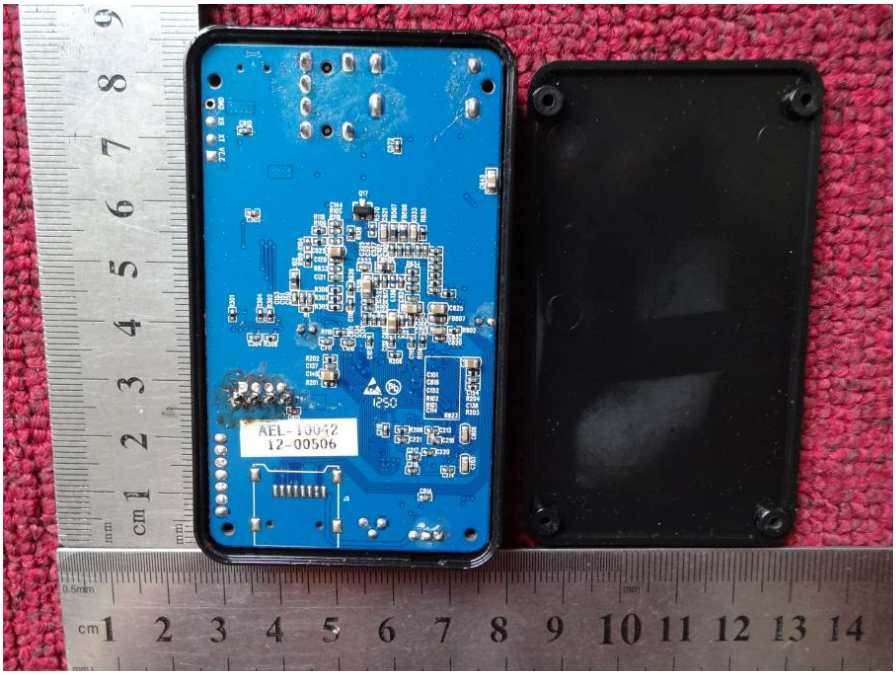
Appearance photograph of EUT

Appearance photograph of EUT

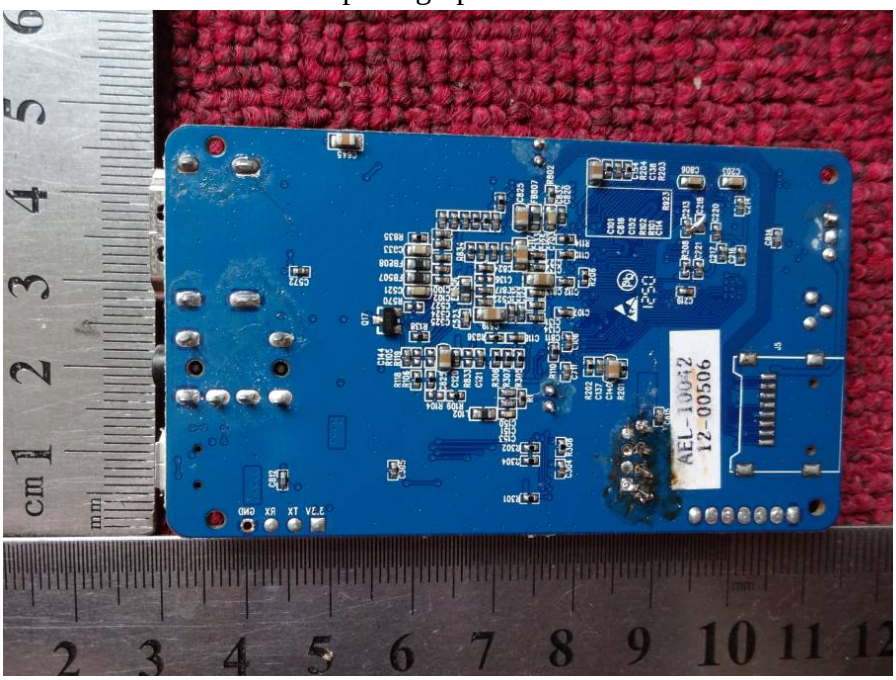
Appearance photograph of EUT

Appearance photograph of EUT

Internal photograph of EUT



PCB photograph of EUT



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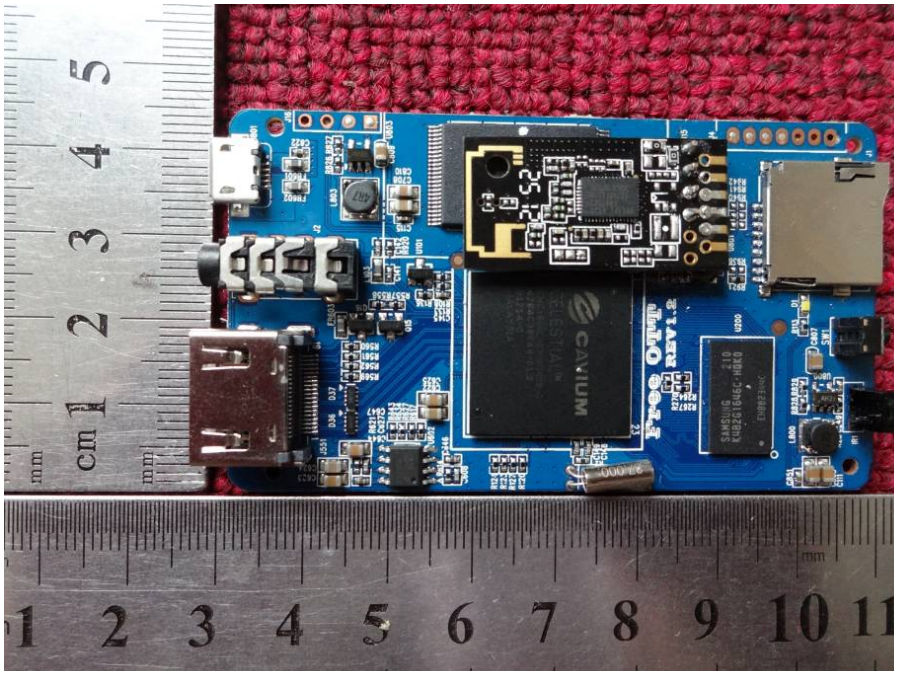

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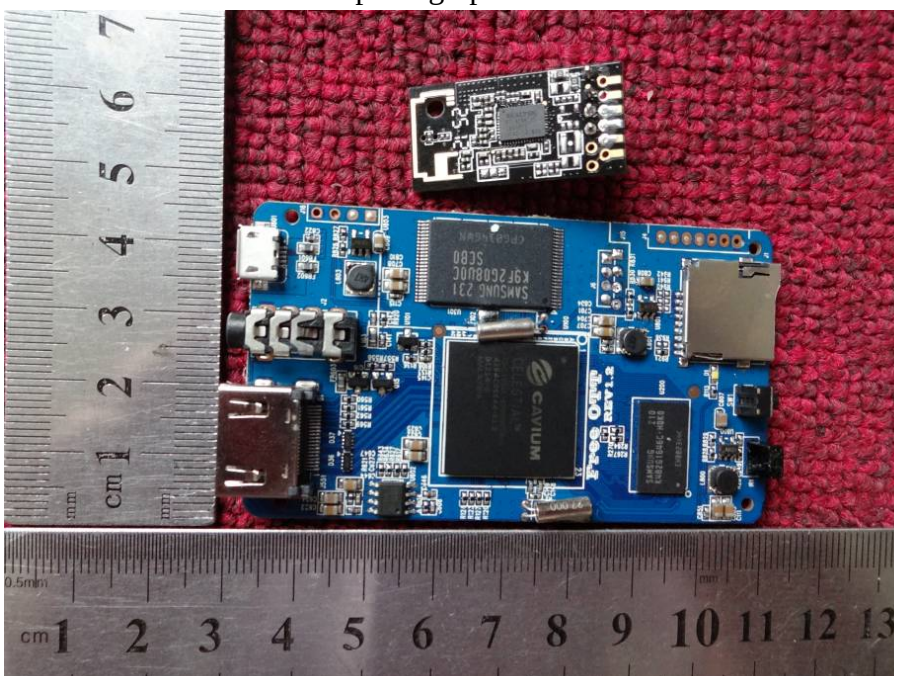

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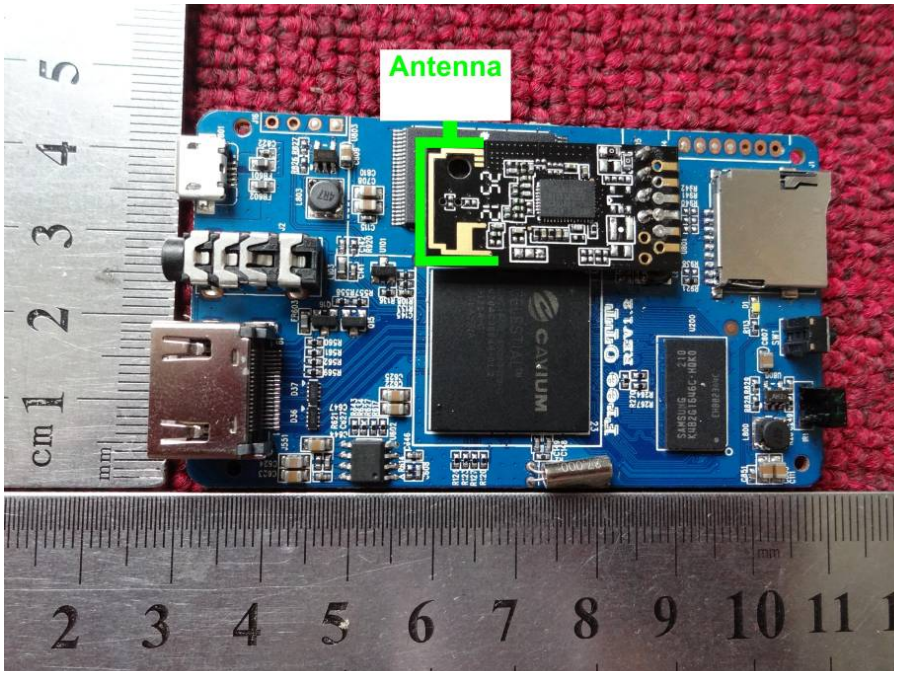

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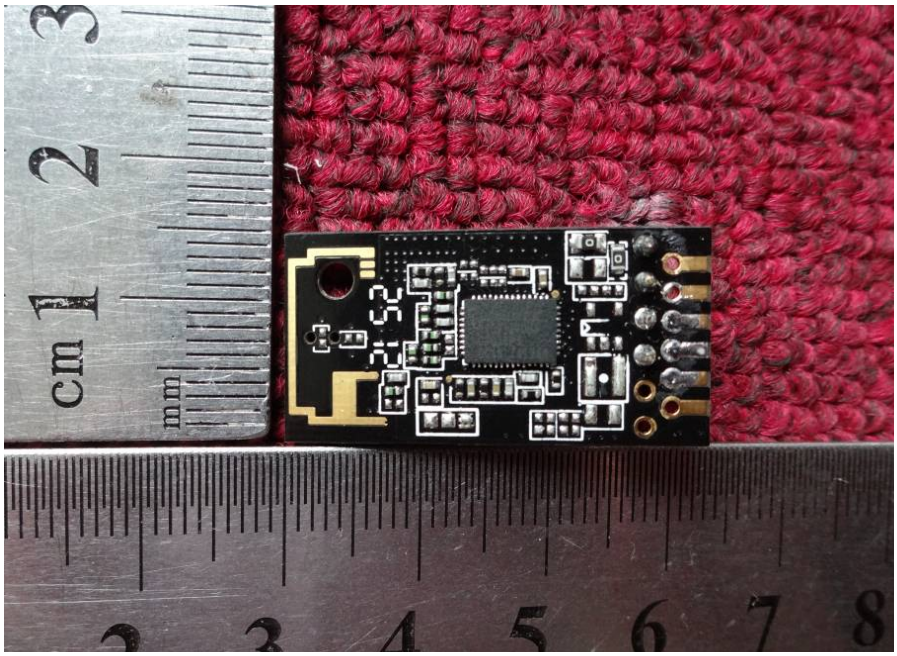

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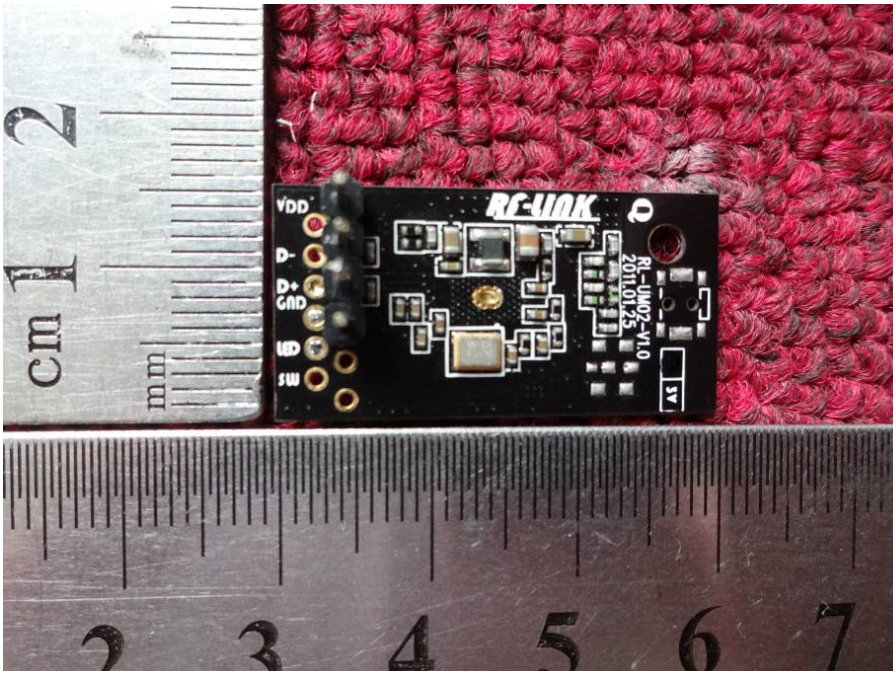

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